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No. 2

International Journal of Orthodontia and Dentistry for Children

Editor, H. C. POLLOCK

ASSOCIATE EDITORS IN ORTHODONTIA

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FRANK M. CASTO

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PAUL G. SPENCER

DEPARTMENT OF DENTISTRY FOR CHILDREN

Associate Editor—WALTER T. McFALL

Contributing Editors—FLOYDE E. HOGEBOOM, THADDEUS P. HYATT,

WALTER C. McBRIDE, F. BLAINE RHOBOTHAM

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International Journal of Orthodontia and Dentistry for Children

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The International Journal of Orthodontia and Dentistry for Children

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VOL. 20

ST. LOUIS, FEBRUARY, 1934

No. 2

ORIGINAL ARTICLES

A BRIEF SURVEY OF ORTHODONTICS*

CARL SCHELLING, L.D.S.Eng., LONDON, ENG.

ONE day about the end of 1908, when the late Sir Herbert Warren, at that time President of Magdalen College, Oxford, was in my consulting room, his eye chanced to fall on a notice headed "British Society for the Study of Orthodontia," and he turned to me with a quizzing look and asked me what "orthodontia" meant. I replied that it was the word used by an American as part of the title of his book and adopted therefrom by the Society, but that if he, a classical scholar, took exception to it, and would give me his reasons in writing, I would gladly bring the matter before the committee, of which the members, I felt sure, had no more desire to be scorned by classical scholars than I had myself! He then suggested my writing to the Rev. Dr. Sir James Murray, editor of the *Oxford Dictionary*, and I did so, and received a lengthy reply, which I had hoped to find in our minute book, stating various objections to the termination in "a" being made to Greek words, and suggesting on the analogy of music and logic, or physics and statics, either ending in "e," or "es" for euphony, and adding that there might be a use for "orthodonty" as describing the condition of a patient, who after treatment has attained straight-toothedness! The Germans now use "orthodontik," being sticklers for correctness in such matters.

I wrote a letter which put before the council of the Society, on February 10, 1909, some information on the etymologic defectiveness of the word orthodontia, and received a reply saying that the council would be glad of suggestions to propose a change in the name of the Society at the next general meeting in December, 1909.

On March 10, 1909, the suggestions were considered by the council, and I was thanked for them and told that the members appreciated my efforts to ar-

*Presidential Address to the British Society for the Study of Orthodontics, 1932.

rive at the correct wording of the name of the Society, and on November 10 Mr. H. Baldwin moved, and Mr. J. H. Badcock seconded, that a change in the name of the Society was desirable, and that the word orthodontia be changed to orthodontics.

On December 8, 1909, the council recommended the change of title to "The British Society for the Study of Orthodontics," and as the originator of the suggestion I explained to the annual general meeting why I introduced the word orthodontics, and on February 11, 1910, the Hon. Secretary was instructed to make the alteration in the Society's book plates and bulletin board as far as the name of the Society was concerned. Dr. Angle, after all, cannot be considered a sure guide in such matters, as even in his seventh edition the term "frenum labii" is erroneously given as "frenum labium."

On my recently telling Sir Arthur Keith of the suggestion of "orthodontology," he replied that he had always understood it to refer to regularity, rightness, rather than uprightness or straightness.

The five lectures on the growth of the jaws, normal and abnormal, delivered under the auspices of the Dental Board of the United Kingdom in 1924 by Professor E. Fawcett, and Professor J. C. Brash (whose description of the mode of growth of the maxilla and the face as a whole and in which he acknowledges his indebtedness to Sir A. Keith and Mr. G. G. Campion, is without a rival), Mr. G. Northcroft and Sir A. Keith contain such a mass of original observation that I dare not attempt to summarize them, but do advise any one who thinks himself acquainted with the subjects to read them, if he has not already done so, and he will begin to learn what great work has been done on the subject. These remarks apply also to the lectures by Sir J. F. Colyer delivered in 1930, also under the auspices of the same authority. The word orthodontia does not occur in the *Oxford Dictionary*, 1909, edited by Sir James Murray. Dr. E. H. Angle, in the 1906 seventh edition of *A System of Orthodontia*, commences chapter one with the words—"Orthodontia is that science which has for its object the correction of malocclusion of the teeth, from the Greek *orthos* (straight), and *odous* genitive case *odontos* tooth."

In the chapter on "Occlusion," p. 14, Dr. Angle shows three beautiful types of normal occlusion, and remarks: "None is absolutely perfect. Probably Nature never makes the truly ideally perfect type in every particular. Each of these dentures slightly differs from the others: in the position of the denture as a whole, in its relation to the skull, in the angle of inclination of the incisors as well as of the other teeth, in the sizes and typical patterns of the teeth, in the length of cusps and consequent overbite of the incisors, in the sizes, width, and curves and arches, as well as in the compensating curves of the plane of occlusion. Yet these variations are but natural, and doubtless in perfect keeping with the distinctive individual types, and we insist that in the main the dentures are exactly alike in Nature's plan of the normal in human dentures. If all were alike in every particular it would necessitate that the three individuals represented by them also be essentially alike in every other particular."

E. H. Woerpel writes: "The ideal of the Roman type, though markedly different from the Grecian, was also closely followed by their painters and sculptors, and where types and religious ideals were so distinctive and so closely

adhered to, there could be certain standards and laws to cover them, especially in creative art, but to use the Grecian or the Roman standard as a standard for the types of the present day, especially in America, is impracticable, for our inheritance, our occupations, our mental activities, our habits of thought, our social and climatic conditions, etc., differ so radically and all those play such a vital part in the molding of the mental, moral or physical, as expressed in our whole bodies, and especially in our face, that a standard type is an impossibility. The tendency of modern civilization seems to be to create a law for each individual, and in the face of complex and constantly changing conditions a fixed type as a basis or standard to govern the molding of the human face cannot be established."

Angle's conclusion in 1903 was that "the best balance, the best harmony, the best proportions of the mouth in its relations to the other features require that there shall be the full complement of teeth and that each tooth shall be made to occupy its normal position—normal occlusion.

"An interesting fact, which the author also believes to be convincing proof of what has already been said relative to harmony of facial lines depending upon harmony of occlusion, is the wonderful harmony of facial types with the types or patterns of the teeth: how the broad and squarish type of tooth harmonizes with a similar type of face."

A few quotations showing the high esteem in which beauty of the teeth and mouth has been held. Though I had recourse to a Shakespeare Concordance, I found no reference bearing on the subject except the description "white as whalebone" in *Love's Labour Lost*. This, Dr. Gollancz says, means the tooth of the walrus, which was formerly used as the material from which artificial dentures were made.

Song of Solomon I, v. 2: "Thy teeth are like a flock of sheep that are even shorn, which come up from the washing whereof every one beareth twins, and none is barren among them."

The value of slaves by the Dutch was lessened by two dollars for each tooth lost, and pedigree dogs' prizes have been very greatly influenced by the condition and regularity of their teeth when shown in competition.

A master of hounds once called my attention to his being "hog-mouthed," a term in common use to describe anterior projection of the mandibular incisor teeth!

Thomas Carew—"In praise of his mistress."

Leaves of crimson tulips met
Guide the way
Where two pearly rows be set
As white as day;
When they part themselves asunder
She breathes oracles of wonder.

Also from "The Comparison":

Thy teeth in white do Leda's swan exceed.

Edmund Waller, the poet, who died in 1687, expressed his detestation of "ill teeth" in the "Epigram on a Painted Lady."

Were men so dull they could not see
 That Lyce painted; should they flee
 Like simple birds into a net,
 So grossly woven and ill set:
 Her own teeth would undo the knot
 And let go all that she had got.
 Those teeth fair Lyce must not show,
 If she would bite; her lovers though
 Like birds they stoop at seeming grapes,
 Are disabused when first she gapes:
 The rotten bones discovered there
 Show 'tis a painted sepulchre.

Avicenna, Arabian, first used sublaxation, and Peter Forest in the sixteenth century. Mouton (1746) for toothache, stretched the dental nerve by sublaxation. Bourdet (1757) removed the first premolar to let the canine erupt, and on the unaffected side to preserve symmetry. For too large and ugly arches he extracted all four premolars, where the deformity is only in the mandible he extracted first molars immediately on eruption after the manner of Caparon. Jourdain (1759) described an improved pelican for straightening teeth inclined inward. John Hunter (born 1728), to correct protrusion of the maxilla advised the extraction of a premolar tooth on both sides, and "to regulate the incisors it is sometimes necessary to rotate on their axes with forceps. In certain cases of protrusion of the mandible one may have recourse with advantage to the inclined plane."

It is not uncommon to find the mandible projecting too far forward so that its fore teeth pass before those of the maxilla when the mouth is shut; which is attended with inconvenience and disfigures the face. This deformity can be greatly mended in young people. The teeth in the mandible can be gradually pushed back in those whose teeth are not close, while those in the maxilla can be gently brought forward which is by much the easiest operation.

These two efforts are produced by the same mechanical powers. While this position of the jaw is only in a small degree so that the edges of the mandibular teeth can by the patient be brought behind those of the maxillary teeth, it is in his own power to increase this until the whole be completed; that is, till the grinders meet; and it is not necessary to go further. This is done by frequently bringing the mandible as far back as he can and then squeezing the teeth as close together as possible.

Also in Chapter VII, "The means of making this pressure I shall only slightly describe, as they will vary greatly according to circumstances; so considerable indeed that scarcely two cases are to be treated alike, and in general the dentists are tolerably well acquainted with the method."

Chapter VII. Hunter advises the extraction of the maxillary last grinder when it bites upon the lower gum, the corresponding tooth not having erupted.

J. R. Duval, of the Society of Medicine, Paris, read a paper on the advice of the ancient poets on the preservation of the teeth, from which he selected: "How can I describe the beauty of her teeth, which she presented to the view in the act of laughter; white, equal, closely and compactly placed, they presented in their arrangement the image of a fine necklace formed of pearls, the most regular and the most brilliant."

Duval also: "We often see the canine teeth ignorantly drawn, when they are irregular, instead of the first grinder. When these teeth have been irregular I have always drawn the first premolar, and have invariably found that the canine has descended into its place." He also quotes several cases of children who have been born with from one to six teeth.

Again—"and of persons of sixty, four-score, a hundred or even a hundred-and-twenty, have cut new teeth. Epitaph suggested:

Here lies an old person once toothless and hoary
Who renewed all his teeth, his health and his hair,
And then was cut off in the height of his glory
After living two ages devoid of all care.

"What exquisite delight a tender mother feels when the last of the twenty milk teeth has made its appearance: the lovely smile of her infant, to which the presence of these teeth adds such a charm, is no longer mingled with disquietude; their whiteness and regular arrangement are objects of her admiration and already inspire a hope that those which are to succeed will possess the same advantages."

A few early observations on the treatment of dental irregularity. P. Fauchard's translated by Mrs. Lindsay:

"Sixth observation in 1712: This young girl had two teeth on the right side of the maxilla very badly out of place and inclined inward on the side of the palate. To regulate these two teeth I used the pelican. I operated on them and put them in their natural place, without giving her much pain. I tied these teeth with thread as usual in order to keep them in place and to avoid the spring of the alveolus and the gums from bending them back again. I succeeded so well that it did not seem that she had ever had distorted teeth; eight days after, I took off the thread and the teeth of this young lady remain firm and regular."

My own grandfather, I was told by an eyewitness, lifted to its proper level a right canine which was so low in the arch as not to be noticeable: it remained in situ and became firm with no aid beyond the frequent application of the child's finger to the region of the apex of the tooth, to keep it from sinking back.

Arthur Thomson, in *Anatomy for Art Students*, says: "The facial angle ranges from 62 to 85 degrees. The former indicates a very marked projection, the latter a more vertical outline. Commonly the angle measures from 70 to 80 degrees, the white races being characterized by the facial angle of from 75 to 80 degrees, the yellow by an angle which ranges from 70 to 75 degrees, while the negroid races display a projection of the lower part of the face which often causes the facial angle to fall below 70 degrees. In other words the European races have more or less straight faces; the yellow slightly sloping faces; and the black markedly projecting faces. In the latter this is further emphasized by the presence of a broad and flattened nose and thick and everted lips.

"In the more highly civilized races, as we have seen, the face is much straighter, and this may account for the ideal forms represented in the antique in which no doubt a sense of dignity is imparted to the features by the undue emphasis of this condition. In some of these the facial angle exceeds a right

angle, a condition not met with in man under normal circumstances. Subjected to these tests, many of the types represented in the antique are impossible, yet in spite of all such criticism they still remain the embodiment of all that is great and noble in art."

The size of the teeth varies in different individuals. The lower races of man as a rule have larger teeth than the more highly civilized. This is no doubt accounted for by the fact that the higher races pay more attention to the preparation of their food by cooking. Large teeth require large jaws, and we can thus account for the massive mandibles met with in many savages. Too big a jaw imparts a brutal appearance to the face, a feature which draughtsmen have often emphasized in representing the criminal type.

In some, owing to the feeble development of the mandible, the chin, instead of being prominent, recedes. This imparts a feeling of weakness to the whole face, in striking contrast to the look of strength and determination associated with a square jaw. The lips should be full and rounded, the red parts being clearly defined from the rest by a more or less prominent margin. The upper lip should project somewhat so as to throw part of the under lip in shadow. The form of the upper lip is often a feature of great beauty. From the angles of the mouth the red part of the upper lip should curve over so as to form an arch, the center of which, however, is interrupted by a gentle groove across its middle from the septum of the nose. As this groove joins the red edge of the lip it breaks the continuity of the curve and imparts to it that characteristic appearance which has been named "Cupid's bow." It is just where this groove breaks the outline that the lip is most prominent. The upper lip varies considerably in length in different individuals, a short lip being regarded as one of the attributes of ideal beauty. The lower lip, though full, should not project so far forward as the upper.

The teeth are not even mentioned in this connection, though the position of the lips depends largely on that of the teeth beneath them.

Cunningham's Anatomy, sixth edition, pp. 1230-31: "The complete or typical mammalian dentition in its highest development, as in the horse, is represented by the following formula:

$$\begin{array}{ccccccc} & 3 & 1 & & 4 & 3 & \\ 1 & - & c & - & pm & - & m & - & 44. \\ & 3 & 1 & & 4 & 3 & \end{array}$$

"In the dentition of man, therefore, one incisor and two premolars are wanting. Different views are held as to which have been suppressed—most probably they are the second incisor and the first and second, or first and last premolars. In general it may be said that the dentition of the lower races differs from that of the higher, in that the dental arches are squarer in front, the teeth larger, and more regular, the canines stronger, the last molars better developed, and the tubercles on the molars more perfect, in the lower than in the more civilized races. It may be mentioned that the teeth of a savage man, if seen in the mouth of a European, would be looked upon as an 'exceedingly perfectly formed set of teeth' (Jones).

"To express the proportion in size of the crowns of the premolars and molars to that of the skull in different races, Flower compared the distance from the front of the first premolar to the back of the last molar *in situ*, with the distance from the front of the foramen magnum to the nasofrontal suture (basi-nasal length) in the form of a dental index.

$$\text{Thus: } \frac{\text{length of teeth} \times 100}{\text{basi-nasal length}} = \text{dental index,}$$

and by this means has divided the various races into *microdont* (index 42 to 43, Europeans, Egyptians, etc.), *mesodont* (index 43 to 44, Chinese, American Indians, negroes, etc.) and *macrodont* (index 44 and upward, Australians, Melaneseans, etc.)."

P. 1118. "Arrangement of the teeth in the jaws: The teeth in each row are arranged in a crossed row—the arcus dentalis—of approximately a semi-oval form. The curve formed by the maxillary teeth, arcus dentalis superior, however, is wider than that formed by the lower set, arcus dentalis inferior, so that when the two are brought into contact the maxillary incisors and canines overlap their fellows in front, and the buccal tubercles of the maxillary premolars and molars overlap the corresponding ones of the mandibular teeth. It will also be seen that, as a rule, the teeth in one jaw are not placed exactly opposite their fellows, but rather opposite the interval between two teeth, in the other jaw. That arrangement is brought about largely by the great width of the maxillary central incisors as compared with their fellows of the mandible, which throws the maxillary canines and the succeeding teeth into a position behind that of the same named teeth of the lower set. But as the mandibular molars are larger in their anteroposterior diameter than those of the maxillary row—and this remark applies particularly to the third molars—the two dental arches terminate behind at approximately the same point.

"The maxillary dental arch is said to form an elliptical, the mandibular a parabolic curve. The line formed by the masticating surfaces of the maxillary teeth as seen on profile view, is usually somewhat convex owing largely to the failure of the third molar to descend into line with the others. Similarly the line of the mandibular teeth is as a rule concave. In both jaws the crowns of the front teeth are higher (longer) than those of the molars."

W. C. Miller's *Veterinary Dictionary*, p. 961: "The teeth of the domesticated animals when compared with men, are extraordinarily free from disease in the strict sense of the term.

"Irregularities. In dogs there may be a discrepancy in length between the upper and lower jaws. In bulldogs, pugs and other breeds of dogs with very short upper jaws, the undershot condition is practically normal, while in certain breeds with extremely long upper jaws the overshot jaws are very common."

To this should be added the observation of Sir J. F. Colyer on dogs—borzoi, greyhound, Aberdeen terrier, bulldog, fox terriers. He gives tables of the average lengths of their jaws and length of teeth, and says: "The study of abnormal positions of the teeth in animals would seem to indicate that when a species or genus is varying in the direction of a shortening of the jaws, the

teeth also tend to diminish in size so bringing about a shortening in the length of the teeth series, but the shortening of the teeth series does not relatively keep pace with the shortening of the jaw. It is not, therefore, unreasonable to assume that this apparent reluctance on the part of the teeth to vary and adjust themselves in proportion to the jaw shortening is one important factor in the production of abnormalities in position of the teeth."

With regard to long and short muzzled bears he remarks that there is evidence that reduction on the size of the jaw may take place at a greater rate than in the girth of the teeth. And it would seem that there is no adequate support for the view that the teeth in any marked degree influence the growth and development of the jaw. "In other words, the development of abnormalities other than those traceable to accidental causes, such as injury, sepsis, etc., is due to the universal tendency of living things to vary."

"Opinions as to the proper treatment of abnormal arrangements of the teeth differ widely, and the lack of agreement on the subject is due in great measure to the fact that our knowledge of the etiology and pathology of these conditions is still very imperfect. The subject has been approached too often from points of view restricted to the local conditions with the result that inquiry into general causes has been somewhat neglected. The study of periodontal diseases in the lower animals has increased our knowledge of the etiology and pathology of that condition, and I am sanguine enough to believe that an extended survey of the animal kingdom would solve many of the problems confronting us in our quest for knowledge as to the causes of the abnormal arrangements of the teeth in man."

Some twenty-four pages follow, giving what I suppose must be the most extensive survey of the irregularities of the teeth of the primates ever made.

To bring these remarks up to date—G. R. C. Stephens, *Lancet*, November 21, 1931, p. 1159—Nigeria. "Among the pagan natives the circumcision is done either by an old woman, or the blacksmith, who also files the teeth of the children to make them more handsome in appearance. Which brings to mind the statement, 'In order to speak the Jewish tongue with more grace St. Jerome caused his teeth to be filed.'"

When I started this address I had not read Mr. G. Northcroft's paper on the teeth in relationship to the normal and abnormal growth of the jaws. When I did I found it had dealt so ably with many of the points which I set out to study, that I did not pursue the subject, but have purchased two books from the Dental Board and present them to our library, so that those as ignorant of these admirable lectures as I was can have no excuse for not being enlightened! They can also there read "concerning certain structural changes which are taking place in our jaws and teeth," by Sir Arthur Keith—short, but crammed with interesting observations.

At our last meeting we heard a good deal about the importance of securing the patient's cooperation; this was impressed upon me forty-six years ago by an old Quaker dentist, Mr. Fox, of Exeter, who related how a young lady about to be married was so anxious to perfect her beauty by getting an instanding maxillary lateral incisor into its proper alignment, that on his inserting a

silver plate struck to cap the mandibular teeth and carrying an inclined plane of gold soldered to it, he found that she had bitten the misplaced tooth into line with its neighbors within a fortnight from the day of insertion of the appliance.

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DISCUSSION

Mr. Pitts said he desired, on behalf of his fellow members, to propose a very hearty vote of thanks to the President for his most entertaining address, so full of interesting and whimsical observations. It was, he ventured to say, an address of a kind in its scope and versatility that they had not had hitherto in the annals of the Society. The President had, in Browning's phrase, "ransacked the ages, spoiled the climes," and, as another poet had said, "surveyed mankind from China to Peru." He (*Mr. Pitts*) felt sure that anybody who was anxious to know what poets, dramatists and others had thought about the subject of teeth and their irregularities, would find in the President's address an indispensable source of delight. He felt that he could not contribute anything in the way of discussion, but he would just say, as illustrating the esthetic point, that he had been rather interested the other day when going through the papers read at the Orthodontic Congress to see that in the course of the discussion on a paper on the treatment of malocclusion by extraction, read by *Mr. Chapman*, one of the speakers—an American—had disapproved of extractions because, he said, from the point of view of Americans they gave the face a pinched expression, and he had added, "We in America like a full type of face with rather prominent teeth adapted for the most efficient mastication." There one had rather an interesting sidelight on how the esthetic factor varying in different countries might set up a sort of orthodontic standard.

CORRECTION OF AN OPEN-BITE CASE COMPLICATED BY AN EXTREME NARROWNESS OF THE MAXILLARY ARCH*

EUGENE J. KELLY, D.D.S., TRENTON, N. J.

THIS case is one of a type which I often see in my practice and for which in my opinion the new Angle mechanism is ideally suited. I shall endeavor to show how this appliance facilitates treatment.

J. H., aged fifteen years when he first came under my observation, had had his tonsils and adenoids removed at the age of five years. He was a mouth-

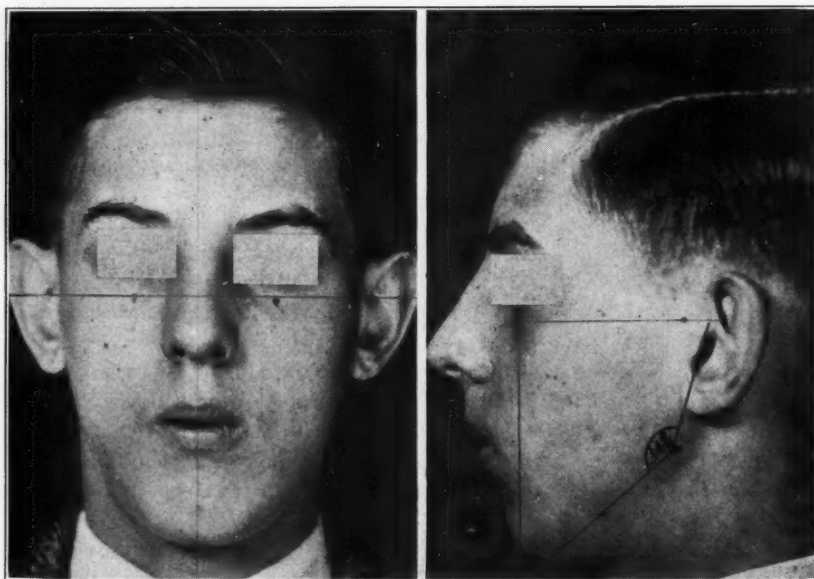


Fig. 1.

Fig. 2.

breather, had one nasal passage completely obstructed, and suffered frequently from common colds, but gave no other history as to what might cause his malocclusion.

Fig. 1 shows the full face of the patient before treatment. Notice the extreme length and narrowness of the face. Fig. 2 shows the profile view. Note that the gonial angle is 148° .

Fig. 3 shows views of the original model. *A* is a view of the right side of the model. This view contains three distinct points of interest: first, there is an extreme abstraction of the premolars and first permanent molar; second, the orbital plane passes through the embrasure between the canine and first premolar; third, the occlusal contact is confined to the first permanent molars, although the slide may seem to portray contact between the second premolars. View *C* shows the left side of the model. Here the abstraction of the molars and

*Read before the New York Society of Orthodontists, New York City, November 14, 1932.

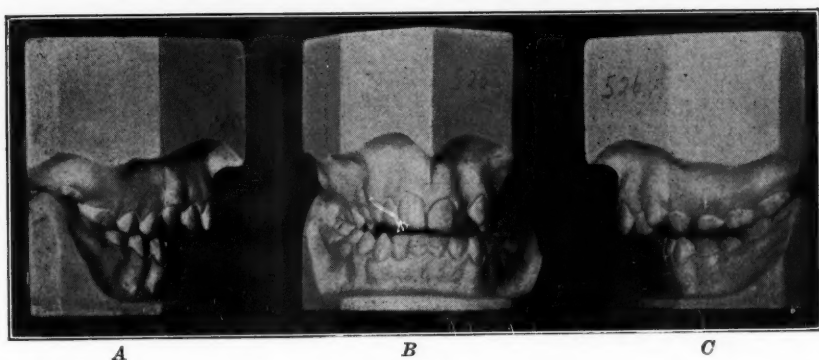


Fig. 3.

Name FEB 20, 1930

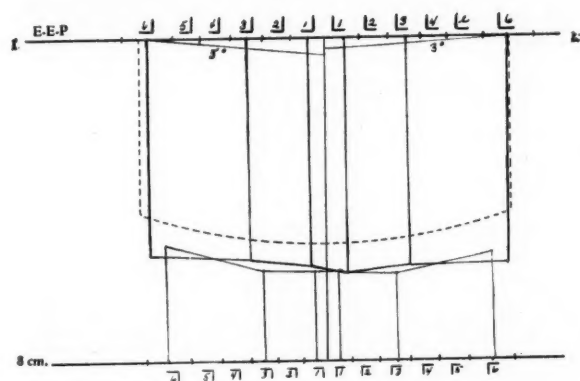
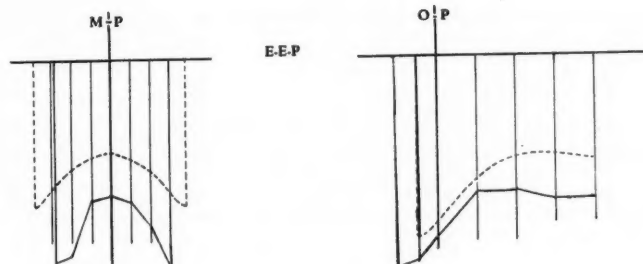
No. 526

6 1/2 8 1/4 8 1/4 6 1/2

Sum = 29.5 Pont = 37 mod 46

Hawley C 33
L 27 = 90
C 30

5 1/2	P	1 3/4	4 1/5	P	- 3 1/2
4	- P	1 3/4	6 2/3	P	- 2
2 1/2	- P	1 1/4	1 7/8	P	- 1 1/2
1	- P	2 2/3	2 2/3	P	- 1



10 cm.

Gonial Angle 148°

Fig. 4.

premolars is practically the same as that on the right side. The orbital plane also passes through the embrasure between the canine and first premolar. The occlusal contact is confined to the first and second permanent molars.

Fig. 4 is a diagnostic chart showing the case recorded according to Simon's gnathostatic method. The following were noted: The narrowness of the maxillary arch; the location of the maxillary prosthion 10.5 mm. forward of the orbital plane; the lack of any overbite in the anterior portion of the denture; the angulation present between the eye-ear plane and the occlusal plane; the abstraction of the entire maxillary denture. Note Pont's measurements, as well as Hawley's on the chart.

Date Feb 20 1950

DIFFERENTIAL DIAGNOSIS

Name _____ Age 15 Sex Male Case No. 526 Chart No. 526

A.—The relations of the lateral halves of the denture to the median plane.			Degree	
Upper	<u>Protraction</u>	Horizontal localization	Mild	<u>Symmetrical</u>
		lateral—incisal—Total	Medium	
	<u>Retraction</u>	Vertical localization	Extreme	<u>Asymmetrical</u>
		dental—alveolar—maxillary		
Lower	<u>Protraction</u>	Horizontal localization	Degree	<u>Symmetrical</u>
		lateral—incisal—Total	Mild	
	<u>Retraction</u>	Vertical localization	Medium	<u>Asymmetrical</u>
		dental—alveolar—mandibular	Extreme	
B.—Relations of the denture to the orbital plane			Degree	
Upper	<u>Protraction</u>	Horizontal localization	Mild	<u>Symmetrical</u>
		lateral—incisal—Total	Medium	
	<u>Retraction</u>	Vertical localization	Extreme	<u>Asymmetrical</u>
		dental—alveolar—maxillary		
Lower	<u>Protraction</u>	Horizontal localization	Degree	<u>Symmetrical</u>
		lateral—incisal—Total	Mild	
	<u>Retraction</u>	Vertical localization	Medium	<u>Asymmetrical</u>
		dental—alveolar—mandibular	Extreme	
C.—Relations of the denture to the horizontal plane.			Degree	
Upper	<u>Attraction</u>	Horizontal localization	Mild	<u>Symmetrical</u>
		lateral—incisal—Total	Medium	
	<u>Abtraction</u>	Vertical localization	Extreme	<u>Asymmetrical</u>
		alveolar—maxillary		
Lower	<u>Attraction</u>	Horizontal localization	Degree	<u>Symmetrical</u>
		lateral—incisal—Total	Mild	
	<u>Abtraction</u>	Vertical localization	Medium	<u>Asymmetrical</u>
		alveolar—mandibular	Extreme	

Fig. 5.

Observe that a number ninety Hawley arch is indicated.

Fig. 5 presents the differential diagnosis of the case according to the three plane system.

First, the relations of the lateral halves of the denture to the median plane: In the maxilla we find a total, dental, alveolar, maxillary contraction that is medium in degree and asymmetrical in shape. In the mandible, we find a total, dental, alveolar contraction that is mild in degree and symmetrical in shape.

Second, the relations of the denture to the orbital plane: In the maxilla we find a total, dental, alveolar, maxillary protraction, medium in degree and symmetrical in shape. In the mandible we find a total, dental, alveolar, mandibular retraction, mild in degree and symmetrical in shape.

- TREATMENT
- Upper— *Extraction*
- Oval Buccal tube
Lingual tube 2nd molar spring
Buccal tube
- 1 Band 6 6
2 Use Lingual appliance Plain lock Tilting lock Auxiliary springs
3 Band 7 7 - Buccal tube 022 x 02
4 Widen 6 - 6 M.M.
5 Widen 8 - 4 M.M.
6 Contract 6
7 Contract 4
8 Band 5 4 3 2 1 1 2 3 4 5 Tie Brackets
9 Step up to 22 x 28
10 Lock to rotations
11 Anterior segment Protract Retract Intermaxillary elastics - Baker type also ventral compound
Intramaxillary elastics Maxillary Bar reciprocal intermaxillary type
Occipital anchorage Chin Cap
12 Incisors Depressed Elevated
13 Align to Hawley Chart 70
14 Retain Hawley Lingual
- Lower—
- Oval Buccal tube
Lingual tube 2nd molar spring
Buccal tube
- 1 Band 6 6
2 Use Lingual appliance Plain lock Tilting lock Auxiliary springs
3 Band 7 7 - Buccal tube 022 x 025
4 Widen 6 - 2 M.M.
5 Widen 4 - 4 M.M.
6 Contract 6
7 Contract 4
8 Band 5 4 3 2 1 1 2 3 4 5 Tie Brackets
9 Step up to 22 x 30
10 Change curve of Spee
11 Elevate Incisors Premolars
12 Depress Incisors Premolars Molars
13 Use stops Loop Spur
14 Anterior segment Protract Retract
15 Lock to rotations
16 Align to Hawley Chart 78
17 Retain Hawley Lingual

Fig. 6.

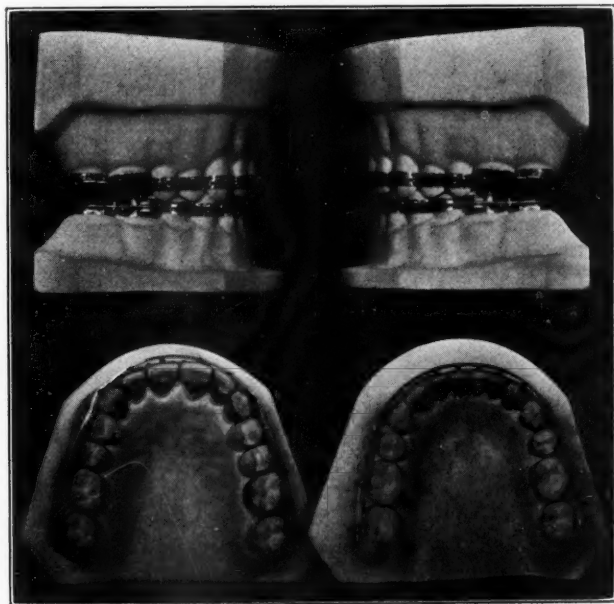


Fig. 7.

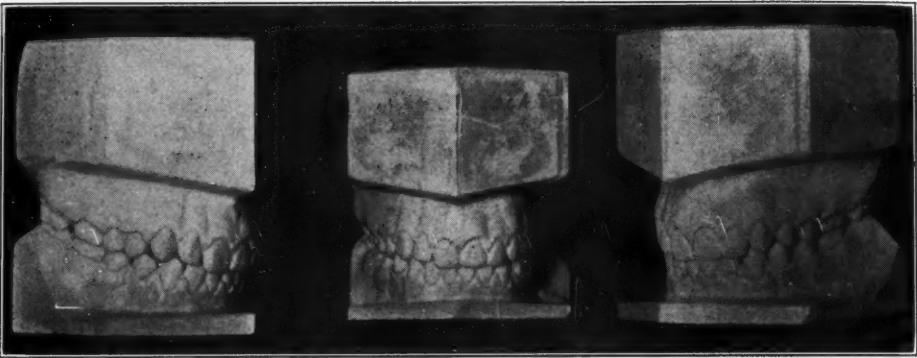


Fig. 8.

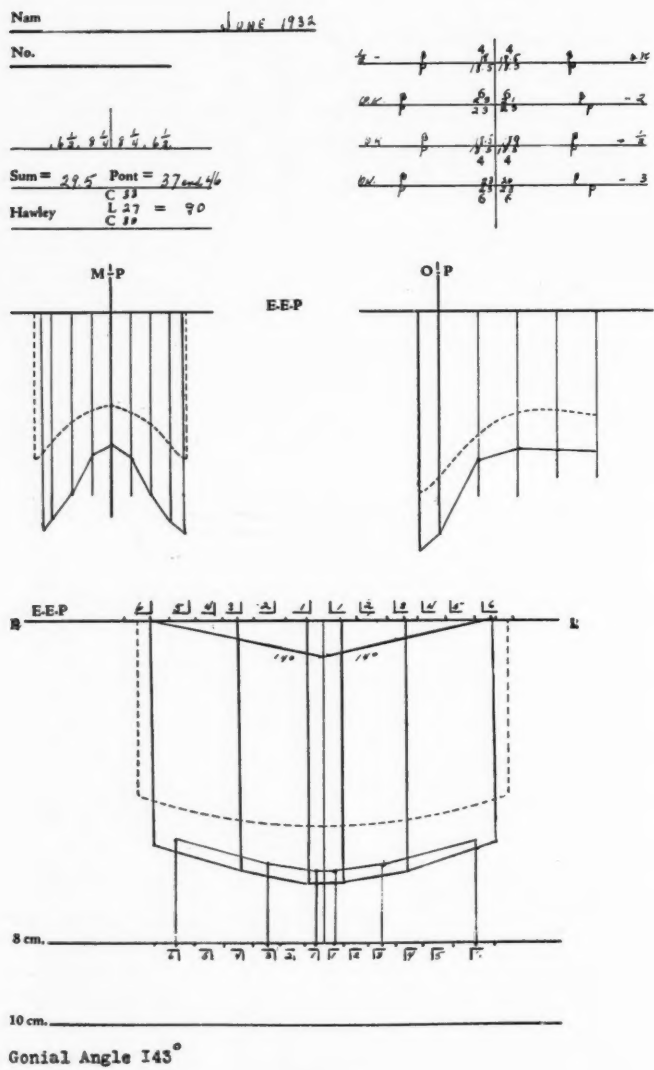


Fig. 9.

Third, the relations of the denture to the horizontal plane: In the maxilla we find a total, alveolar, maxillary abstraction extreme in degree and symmetrical in shape.

In the mandible we find a total, alveolar, mandibular abstraction medium in degree, and asymmetrical in shape.

Fig. 6 is an outline of treatment. The first operation was the removal of the deciduous molar. The next step was the banding of the first permanent

Fig. 10.



Fig. 11.

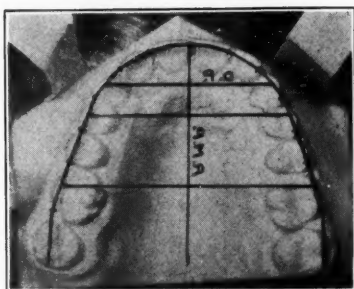
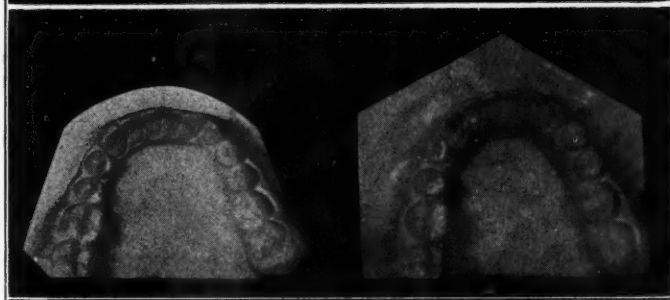


Fig. 12.

molars in the maxillary series and the construction of a lingual arch wire. This was used for a period of approximately four months.

Fig. 7 illustrates the appliance minus the lingual arch wire. In the maxillary arch all teeth anterior to the first permanent molars were banded with tie bracket bands. The first and second molars were banded with seamless molar bands. The attachments on the first molar bands consisted of extra wide tie brackets soldered to the buccal surfaces. The attachments on the second molars consisted of buccal tubes, 4 mm. in length, to accommodate the 0.022×0.028 labial arch wire. Round arch wires ranging from 0.018 to 0.022 were used to

"step up" the arch until such a time as the edgewise arch could be used. However, the edgewise arch wire was used only for a comparatively short time, as intermaxillary elastics, namely, Baker's and vertical, compound reciprocal were used. It was feared that if vertical elastics were used in conjunction with the 0.022×0.028 wire, a forward tipping of the apical ends of the anterior teeth would result with a stripping of bone from the root surfaces.

The patient was seen once every three weeks for twenty-six months. Fig. 8 shows the results.

Fig. 9 shows the chart of the completed case.

Fig. 10 shows a comparison of the original and finished maxillary models, and Fig. 11 shows a comparison of the original and finished mandibular models.

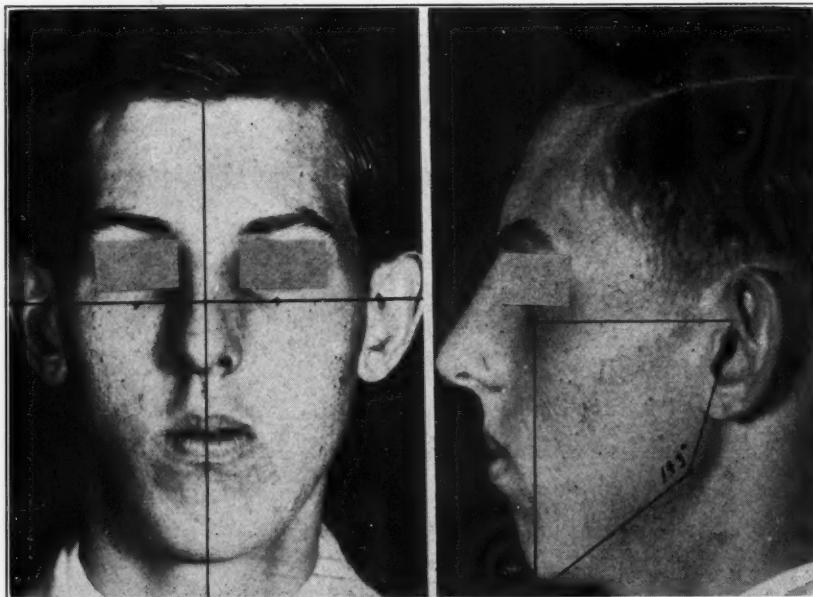


Fig. 13.

Fig. 14.

You will recall that when the chart of the original condition was shown, mention was made of the fact that a Hawley No. 90 was indicated. Fig. 12 shows a Hawley chart No. 90 superimposed on the finished maxillary model.

A comparison of the original and finished charts may be made from Figs. 4 and 9. Compare the widths of the maxillary arches and the location of the prosthion on each chart. A difference of about 5 millimeters is evident in the location of the prosthion on each chart. Note also the change in the overbite and the change in the angulation between the eye-ear plane and the occlusal plane.

Figs. 13 and 14 show the full face and profile view of the patient's face after treatment. On the profile view the gonial angle measures 143° , a change of 5 degrees from the original measurement of 148° .

I should like to acknowledge, at this time, my grateful appreciation to Dr. Ralph Waldron for the counsel, assistance, and encouragement he gave me which enabled me to carry this case to a successful termination.

THE IMPORTANCE OF NASAL BREATHING IN CORRECTING SOME TYPES OF MALOCCLUSION*

O. HENRY, D.M.D., L.D.S., R.C.S., LONDON, ENGLAND

IN ORTHODONTICS we are interested in the normal functioning of three groups of muscles: the facial muscles, the muscles of mastication, and the tongue with the muscles of deglutition.

The importance of the first two groups has long been recognized, but it remained for the late Dr. Richard Summa to lay stress upon the importance of the normal functioning of the tongue.

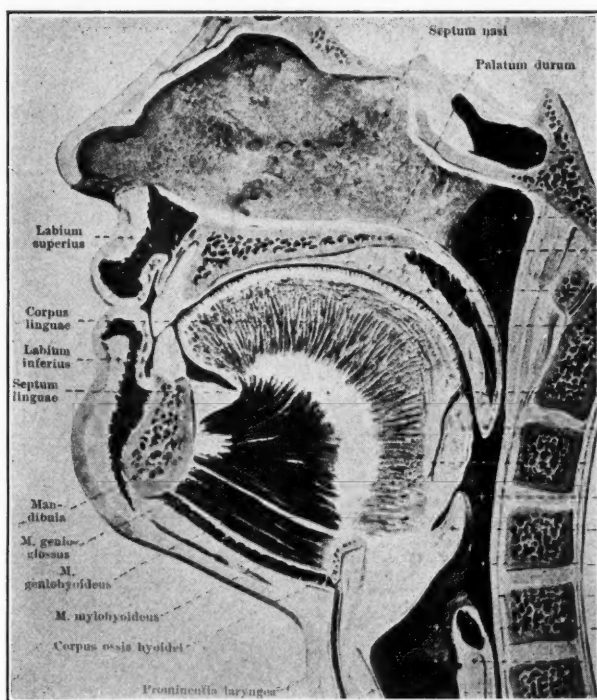


Fig. 1.—Figs. 1-3 from Spalteholz, *Anatomie*.

In his article in the *INTERNATIONAL JOURNAL OF ORTHODONTIA*, August, 1932, he called attention to the fact, that the technic of wind instrument playing demands perfect functioning of the tongue and the lips, that teachers of wind instruments find that pupils with malocclusion cannot be taught to play such instruments, thus confirming that there is perverted functioning of the tongue and the lips in most malocclusions.

My attention was directed to this perverted functioning of the tongue and the lips by my observation that in most cases of malocclusion the children could

*Read at a meeting of the European Orthodontological Society, Paris, May 26, 1933.

not whistle. This was originally made clear to me when, as a certain case progressed, the boy chanced joyfully to remark that he could now whistle for his dog. From that time on, I have given special attention during treatment to the normal functioning of the tongue and the lips, as in deep nasal breathing and in whistling.

Fig. 1 is a sagittal section as it would be in normal nasal breathing. Nasal breathing concerns two groups of muscles in which we are interested: the facial muscles and the tongue with the muscles of deglutition. It will be seen that during respiration the tip of the tongue is placed firmly against the lingual surfaces of the mandibular incisors, the tongue then presses against the cingula of the maxillary incisors, is arched up against the hard palate, at the center of which a vacuum is formed, by which the soft palate is brought into contact with

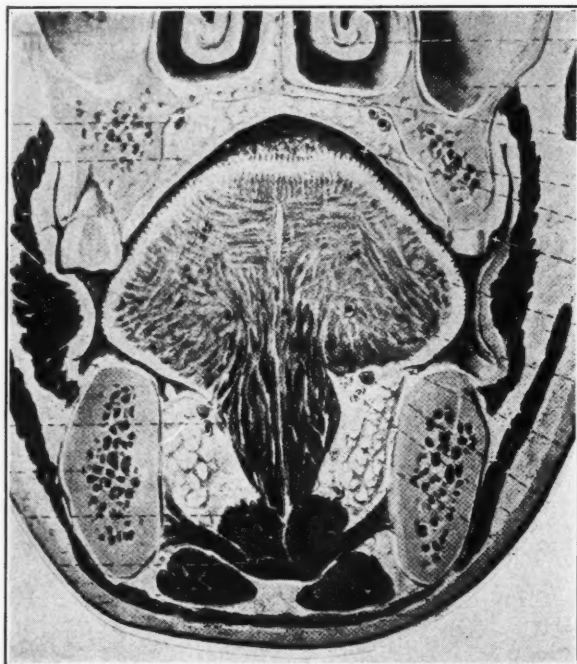


Fig. 2.

the posterior portion of the tongue, thereby closing the cavity of the mouth from the respiratory tract, the lips being firmly closed. The elevator muscles are relaxed, and the mandible is held in place by this vacuum—atmospheric pressure.

Fig. 2 is a coronal section. In whistling, the mandible drops still further; the upper lip is pulled down over the incisal edges of the maxillary incisors; the tip of the tongue is still held firmly against the lingual surfaces of the mandibular incisors; and a channel is formed between the center of the tongue and the hard palate, through which the air is forced; therefore, in whistling the tongue and the lips are functioned along the lines desired.

Fig. 3 is an anatomical drawing of the facial muscles at rest. You see the closed lips and the square chin of the normal breather.

In some cases of malocclusion, after correction of the irregularity of the teeth, the tongue and the lips assume their natural positions and the patient

unconsciously becomes a normal breather. But, as there are many cases where this does not follow, muscle training should accompany treatment.

The next four slides show open-bite cases; and as the open-bite in these cases was corrected by muscle training, it is quite evident that here the open-bite was the result of perverted functioning of the tongue and the lips.

CASE 1.—Girl, aged eighteen years. The upper row of Fig. 4 shows models taken some time before the patient came to me. The three first molars marked had already been extracted, the maxillary arch had been expanded, and the only teeth which were in occlusion were the second molars.

The patient wore only a maxillary appliance to keep the teeth in good alignment. She obtained the results shown in the lower row of models, by bringing the lips firmly together and breathing through the nose, learning to whistle and also by developing the temporal masseter group.

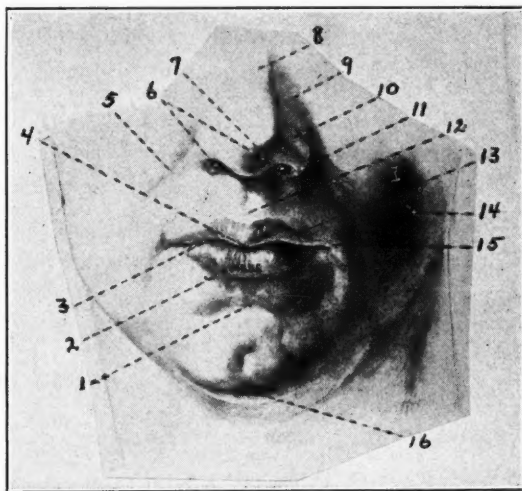


Fig. 3.—1, Sulcus mentolabialis; 2, labium inferius; 3, rima oris; 4, tuberculum labii superioris; 5, sulcus nasolabialis; 6, nares; 7, apex nasi; 8, dorsum nasi; 9, basis nasi; 10, ala nasi; 11, margo nasi; 12, philtrum; 13, labium superius; 14, bucca (mala); 15, angulus oris; 16, mentum.

CASE 2.—Boy, aged thirteen years. Posteroclusion with open-bite. The upper row of Fig. 5 shows the models before treatment. The maxillary teeth had been very prominent; he had knocked one incisor out and had broken off the other, the prominence of the maxillary front teeth had been corrected before he came to me. The postnormal relation of the arches was then corrected in the usual way, and the open-bite was corrected by muscle training as in the preceding case.

CASE 3.—Boy, aged six years. Posteroclusion with open-bite. In this case, the perverted functioning of the tongue could be distinctly seen. Here also arch relationship was corrected in the usual way and the open-bite was corrected by means of the same muscle training. (Fig. 6.)

CASE 4.—Girl, aged four years. Posteroclusion with open-bite. As before, arch relationship was corrected in the usual way, and the open-bite corrected by means of the same muscle training. (Fig. 7.)

Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



The next case is one where the anteroposterior relation of the arches was correct, but through perverted functioning of the tongue and lips the arches were so narrow that the front teeth protruded as in posteroclusion, Division 1.

CASE 6.—Boy, aged fourteen years. Fig. 8 shows the occlusal view. Note the long, narrow arches, with labial version of the maxillary and mandibular anterior teeth, which distinctly shows that there is a perverted action of the tongue between the teeth.

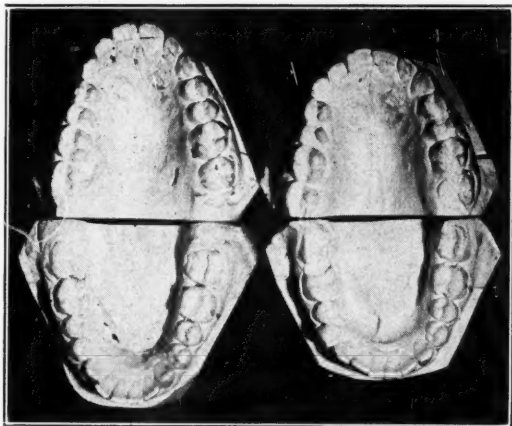


Fig. 8.



Fig. 9.



Fig. 10.

Fig. 9 shows models before and after treatment.

The arches were brought into proper arch form, but in spite of this correction the tongue and the lips did not unconsciously assume their normal positions, the mouth-breathing continued and the lip position remained abnormal, as in posteroclusion, Division 1. I had to keep this case under muscle training much longer than I had anticipated, for I knew I could not hope to retain the teeth

in their corrected position unless the perverted functioning of the tongue and the lips were overcome, for I felt sure it was this perverted functioning that had caused the irregularity.

It is universally agreed that in posteroclusion, Division 1, there is abnormal respiration—mouth-breathing. The prominence of the maxillary front teeth prevents the lips being closed, when at rest, and the tongue cannot assume its normal position.

Therefore during treatment of these cases, it is important to employ muscle training, so that by the time the irregularity has been corrected, the perverted muscular functioning has also disappeared. Muscle training definitely accelerates the progress of these cases, as proper lip functioning helps to bring the teeth back into the mouth as soon as the maxillary arch is sufficiently expanded.

CASE 7.—Girl, aged eighteen years. Posteroclusion with prominence of the maxillary front teeth. (Fig. 10.) The mandibular first molars had been extracted. I am presenting this case not because there is anything unusual about it, but because the progress of the case was so much accelerated by muscle training. The upper lip was so short that in repose it rested up above the maxillary front teeth, and it was astonishing to see it gradually lengthen, until finally the lips remained closed when at rest. There is now beautiful reconstruction of the bone over the roots of the maxillary front teeth, where formerly there was only a thin plate, because of the constant pressure of the upper lip on them when at rest.

I have presented these few cases to show how important it is, throughout treatment, to strive by muscle training to obtain normal muscular pressure of the lips and the tongue, with its attendant atmospheric pressure in the mouth, such as we have in normal respiration.

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Summa, Richard: A New Method for the Correction of Stubborn Types of Mouth-Breathing, *INTERNAT. J. ORTHO. & DENT. FOR CHILDREN* 18: 843, 1932.

THE SOFT RUBBER PLANE

E. F. BUCKLEY, D.D.S., LITTLE ROCK, ARK.

THE soft rubber bite or guide plane is limited to a very few cases, viz., opening the bite and replacing intermaxillary elastics in some cases of individuals under the age of fourteen years. Should expansion be indicated in the treatment, this movement must be accomplished before employing the rubber plane.

Principal features of the appliance are:

1. Being removable it allows for perfect prophylaxis.
2. Permits of thorough exercise of the teeth during the process of mastication.
3. Elimination of traumatism.
4. Speed.

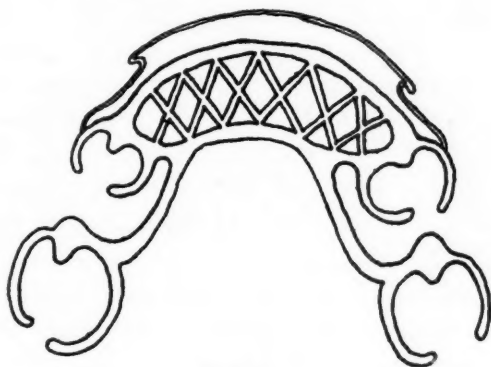


Fig. 1.



Fig. 2.

5. Very few adjustments. I have replaced the soft rubber only on account of porous vulcanization, and in one instance I found the patient trying to chew gum with the appliance intact.

Fig. 1 shows the appliance is of Akers construction, grid base for the hard rubber being cast integral with supports and attachments. A thin coating of hard rubber is vulcanized flush with margins of grid bringing the rubber up on the posterior to form a retaining wall for the support of the soft rubber, also to present a polished surface to the tongue. (Fig. 2.) Third step, of course, is to place models on the articulator and raise the bite to the required height. (Fig. 3.) Fill wax in the channel to conform with outline of the soft rubber plane and in contact with mandibular incisors and canines at the desired angle. If possible use for the plane the material from which rubber stamps are constructed. Anterior support of the plane must be as near a feather edge at contact surface as sacrifice of strength will permit, and placed as close to gingiva as possible in order to provide a fulcrum for turning points of incisors down and

the roots forward into line of profile. Labial extension is constructed of 20 gauge spring wire, flattened across incisal area for strength and resting just above incisal points and controlled by loops at canine area. Fig. 4 shows the finished appliance. The same results can be accomplished by using a vulcanite denture with stainless steel wire clasps, fashioning soft rubber plane as previously described.

I have constructed several removable mandibular appliances for these cases, but in combination with the maxillary all of them interfered with the patient's speech. At present I am using the standard lingual arch bar with half round pin and tube attachments, the bar being in contact with lingual surface of all incisors and canines. A labial extension is soldered to bar and controlled by

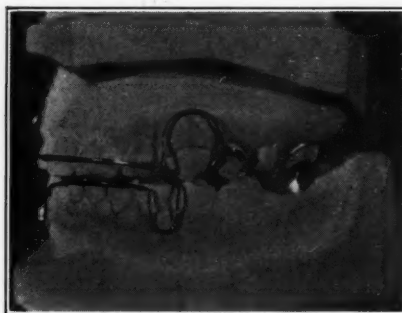


Fig. 3.

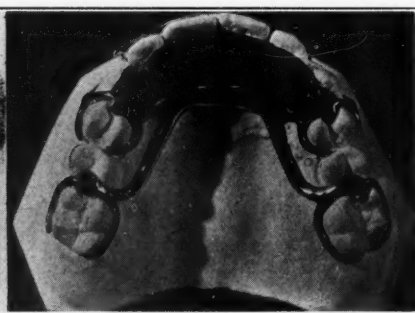


Fig. 4.

loops at the canine area. Extension is of 21 gauge spring wire, flattened at incisal area for strength and resting just below the incisal points to prevent tipping of same from the force of contact with the maxillary incline plane. Should the bite be too close to allow for the passage of the labial extension through approximal spaces, a labial arch will have to be added.

In my brief experience with this character of appliance, results have been that with the proper cooperation of the patient, in a child twelve years old, normal development of molars and premolars will be established within a period of two to three months. In one case of distocclusion (girl of fourteen) by using a rather acute forward angle on the plane, the mandible was brought into normal occlusion without the use of intermaxillary elastics.

THE CRISIS IN ORTHODONTIA*†

ALBIN OPPENHEIM, VIENNA, AUSTRIA

(Continued from page 18, January)

All the different objections which have been voiced against the use of ligatures have been correctly answered by Winkler through his assertion that ligatures should not serve to produce forces, but only to transmit them.¹⁴

After the tension of the arch has expired, *the ligated tooth cannot return to its original position*. There is no possibility of a back-and-forth movement. The connection of the tooth to the arch by means of a ligature may be compared to the function of a joint,‡ and the tooth is therefore freely exposed to the stimulations from the masticatory forces, as well as to the stimulations of tongue, cheeks and lips. Its functional stimulation is hardly interfered with.

The objection to a back-and-forth movement, a "jiggling," can be made with more justification against the lingual arch, which is unstable in its position; against the auxiliary springs which are also unstable; and against the frequent breakage of auxiliary springs, in which case the tooth, deprived of its support, may return more or less to its original position, depending upon the time which elapses between the breakage and the repair.

Wilson, of California,¹⁵ who is one of the most successful modern students of Angle, using the new Angle method, reports several cases treated with a lingual arch, which he had an opportunity to examine. According to the reputation of the orthodontist who had treated these cases, he had expected to find the best examples of a highly efficient technic.

However, upon making a roentgen examination, he noticed in three cases the typical change brought about by "jiggling," namely, a thickened periodontal membrane around the roots of molars and incisors.

M. Shelden,¹⁶ after making numerous examinations, came to nearly the same conclusions.

The instability of the lingual appliance and the unfortunate results caused by this instability are discussed by Winkler in a clear manner.¹⁴

Salamon states that due to the shortness of the vertical tubes, the Mershon appliance does not provide for enough stability; and that in this respect, it has up to date not yet reached the steadiness of the Angle appliance.¹⁷

The Angle arch, which is, without any doubt, more stable than the lingual arch, permits, if it is used correctly, nearly always a treatment without "jiggling."¹⁸ The teeth can, and—if the arch is used correctly—must remain painless and serviceable. As a matter of fact, Angle himself for the first time in

*From the Department of Orthodontia of the Dental Institute of the University of Vienna.

†Translated from *Zeitschrift für Stomatologie*, Nos. 7 and 8, 1933, published by Urban and Schwarzenberg, Vienna and Berlin.

‡Kantorowicz: *Klin. Zahnheilk.*, S. 493.

1900 stressed the value of functional stimulation (in the sixth edition of his book, on page 184), as an important aid to orthodontic treatment.

It is also one of Mershon's main principles of treatment to utilize function as an aid, even during the time of active tooth movement.

The correctness of this principle, however, is denied by Schwarz,* who contends that "a certain amount of loosening of the teeth during movement cannot be avoided, even under ideal conditions." For this reason, he feels that "it is undesirable to place orthodontically moved teeth under full function, because, due to the loss and the weakening of the suspending fibers, they are not able to carry their normal stresses." In addition to this demand not to subject the teeth to full function, he also states that results can be accomplished in a much shorter time by use of the lingual arch, as compared with that of the labial arch.¹⁹ These two statements in themselves seem to indicate that he is using too strong forces.

My contention in this regard is reaffirmed by Korkhaus, who says that "it is possible even with auxiliary springs to make too strong adjustments, and then the teeth are liable to tip and to be sore just as they have done with the rigid Angle arches. Tipping as well as pain he considers as symptoms of too strong forces used."

I have already furnished the histologic proof for the reason why especially by the use of intermittent forces teeth may be kept firm and painless, and that they always may be subjected to full function.

In deciding the question whether continuous or intermittent forces produce a more biologic treatment, the problem of the osteoid and its relationship to the cementum must again be considered.

On the basis of the traumatic occlusion experiments which Gottlieb-Orban have conducted on dogs, as well as on the basis of their previous histologic material, they have come to the conclusion that new osteoid bone offers more resistance to resorption than old, normally calcified bone. From this deduction they make the following suggestions for orthodontic treatment (Schwarz)†:

"The newly formed uncalcified bone is more resistant to resorption than the old calcified bone. For this reason, interruptions in the application of force should be avoided during orthodontic treatment as much as possible, because in each such interval a new alveolar wall is formed; if then the force is newly applied, resorption may attack the tooth surface more easily, because of the increased resistance of the newly formed osteoid alveolar bone."

Gottlieb and Orban state further (p. 224): "We have found in our experiments that on the left side of the jaw of the animals where the teeth were subjected to gentle pressure, continuous bone resorption occurred, while the root surface on this side appeared intact. Such a condition presents the ideal for orthodontic purposes, namely: movement of the tooth through transformation of the bone, with the root surface remaining intact. This presupposes gentle continuous forces.

*Fortschr. d. Orthodontik, p. 31, 1932.

†Fortschr. d. Orthodontik, p. 555, 1931.

In *one* human jaw (Fig. 9), Gottlieb and Orban have observed, as an incidental finding, a reversal of those conditions which are usually found in traumatic occlusion, namely, extensive resorption of the root surface with the bone remaining comparatively intact. From this finding, though it was produced through the *strongest intermittent forces*, they draw the following conclusion for orthodontia, *though orthodontia employs only the gentlest continuous forces*: "One should beware in orthodontic treatment to permit too frequent interruptions in the application of forces. In each interval new bone formation in the area of pressure takes place, and if later tooth movement is again instituted, this newly formed bone must be resorbed again. Therefore, a continuously acting gentle force appears to be the most advantageous to use."

At this time I only repeat these statements; a critical discussion of them shall follow in a later paper.

On the teeth of monkeys in my experimental series (Figs. 2 and 12) which were moved labially and lingually, I have demonstrated that only shallow resorptions were produced in the cementum, never exceeding one-half the thickness of the cementum; and this happened although frequent adjustments were made at five-day intervals, and although during this time new osteoid bone could have formed, and although the tooth was being pressed against this osteoid bone every time a new adjustment was made.

One of these very shallow cementum resorptions, which has attacked the surface only, is visible in Fig. 6. In Fig. 7 (which is a higher magnification of area A from Fig. 6), we see that the osteoid tissue is being resorbed again through numerous osteoclasts (OK) under the influence of the newly applied force, while the cementum surface remains intact. In the specimens showing lingual movement (Figs. 12, 13 and 14) not a single cementum resorption is noticeable, despite the fact that the force was intermittent, and that it was so strong (rubber wedge) that even a deviation of the apex occurred.

In all my experiments on dogs the adjustments were made at intervals of never less than eight days, and therefore a period of comparative rest always occurred. Still, though apposition exceeds resorption, and though, therefore, osteoid bone always was formed, we find not a single root resorption, not even a suggestion of it, in all the experiments, which extend over a period of more than five weeks.

Neither can a sign of resorption, which may be traced to orthodontic interference, be found in any one of the retention experiments (to be demonstrated later), despite the fact that these teeth had been moved for forty days with adjustments on every fifth day.

The osteoid tissue which is formed during the rest periods does not endanger the root surface of the dog's teeth, and only rarely those of the monkey's teeth, provided that gentle forces are used.

The exaggerated fear of root resorptions and the advice to work only with gentle continuous forces are derived from incorrect conclusions, based upon animal experiments, which cannot be applied to human beings. *Neither is it permissible to use for orthodontic considerations conclusions from histologic findings in men under conditions, which, for many reasons, cannot be used to draw conclusions for orthodontic treatment.*

With the use of gentle intermittent forces, the periodontal membrane recovers comparatively quickly, because of the rapidly reestablished blood supply, from the application of a pressure which extended only over a short period of time, even if the force was occasionally somewhat stronger. It soon regains its ability to react biologically, to form osteoclasts, and to resorb bone. Also the cementum quickly regains, through its rapidly reestablished normal blood supply, its original resistance against resorption.

In the use of continuously acting gentle forces, the danger lies in the small limits of permissible pressure. If these limits are exceeded even to a slight degree, the extensive pressure, because it acts continuously, leads to a compression and anemia of long duration. This reduces the vitality of the periodontal membrane and creates a situation that is responsible on the one hand for the lack of proper bone reactions, and on the other hand for the development of root resorptions.

If we further consider the difference in the reaction of bone and cementum in young persons, where the cementum is much more resistant than the bone, then the danger of root resorption may be considered as very small indeed. This is especially so because the forces used in common practice are so small that they cannot even be compared with the forces used in the experiments of Gottlieb and Orban, where frequent root resorption could be noticed especially in old animals.

Schwarz says that in the experiments of Gottlieb and Orban on traumatic occlusion, root resorptions were produced by forces which crushed the periodontal tissue, so that the neighboring tissues, which retained their vitality, reacted with a rapid resorption, in order to eliminate the excessive pressure; this resorption then attacked bone as well as root surface.*

The experiments on traumatic occlusion with young animals, carried on over a rather long period of time, showed the infrequency of the root resorption as compared with the bone resorption, and demonstrated that young teeth have a considerable resistance to root resorption.⁵

Furthermore, an occasional root resorption should by no means be considered too seriously, because we usually find a replacement of the resorbed tissue through secondary cementum. This secondary cementum completely takes over the function of the normal cementum and it furnishes an equivalent anchorage for the attachment of the periodontal fibers.

The ultimate future of cementum resorptions is described by Gottlieb and Orban in several places; one of them reads: "The tooth surface may either be completely restored, or it may show a small indentation" (p. 166).

Sandstedt states that "only if orthodontic treatment is carried on irrationally, if the forces exerted upon the teeth are too strong, too sudden, or unfit for tooth movement, only then are teeth being damaged through orthodontic treatment . . . as a rule, the tissues of the tooth itself may be considered as being immune to injuries through orthodontic treatment, if it is performed correctly.

*Schwarz: Fortschr. d. Orthodontik, p. 550, 1931.

After all this it may be said that the danger of root resorption due to the formation of osteoid tissue in the use of intermittent forces, which again and again is being expressed by Gottlieb and Orban and by Schwarz, can be considered at least as highly exaggerated.

Neither can the biologic difference in reaction between bone and cementum (Gottlieb²⁰) be denied, nor the fact that the newly formed osteoid bone has probably greater resistance to resorption than normally calcified old bone. However, the resistance of the cementum to resorption is still greater than that of the osteoid, provided that the vitality of the periodontal tissues is not disturbed and that bone as well as cementum can react biologically. As the bone is much more ready to undergo biologic changes than the cementum (regardless of whether it is old bone or new bone) it will always be more readily resorbed, under the proper stimulation, than will the cementum.

It has become a modern slogan in the orthodontic literature that the cementum is in danger of resorption especially when intermittent pressure is applied, through that osteoid tissue which is being formed in the intervals. *However, the intermittency or the continuity of the force has nothing whatever to do with it.* In both these methods it is the *extent of force alone* that is responsible for the root resorptions, if it exceeds the permissible compression of the periodontal membrane.

May I be permitted here to voice some doubts against the "four degrees of biologic reaction" of Schwarz. First of all, such a subdivision is too theoretical, and of only minor significance for the practice of orthodontia (because severe damage, as has been pointed out, can be produced by *strong intermittent*, as well as *weak continuous* forces). Furthermore, the conditions upon which the correctly measured force is dependent are so complicated and manifold that their evaluation in each specific case becomes a confusing task for the average orthodontist. On the other hand, the fact is commonly accepted now that in order to render biologic treatment, the diameter of springs should not exceed 25 gauge.*

According to Korkhaus, "the responsiveness of the bone is, and remains, the unknown quantity with which the orthodontist has to contend in each individual case." However, we should give nature through the use of intermittent forces, through shorter or longer intervals, sufficient time to compensate the trauma caused by *every* orthodontic interference. In such a way the functional stimulations will exceed the appliance stimulations, and our interference will be reduced to the lowest possible level. This can be accomplished only through a rationally planned and executed treatment, with long monthly rest periods with sometimes complete removal of all appliances, which principle we find applied by Mershon and his students.

"In the average case that I treated taking the whole period of time they are under my care, I leave the appliances off almost as much as the child wears them, allowing the whole dental machine to develop under its own function and not by artificial stimulation."²¹

"With the stress from mastication less frequent and the pressure of the appliance continuous for a long time and both in a different direction, these

*Körbitz, A.: Die orthodontische Situation der Gegenwart, D. z. W. 89: 1933.

forces, as Conklin says, may act as conflicting stimuli, or the force from the appliance being continuous would act as the controlling stimulus."²²

"This rest from treatment is really a stage in treatment."¹⁰

And even Mershon who works with so much precaution, which he bases upon the consideration of the biologic standpoint, makes the following statement of warning: "It is more than likely that we bring about the change in the position of the teeth far more rapidly than the changes take place in the correlated tissues."

In my paper entitled, "Root Resorptions in Orthodontic Treatment,"¹⁸ I have laid down the following rules:

1. The appliance must be of delicate construction.
2. The force applied must be reduced to a minimum.
3. The periods of active treatment must not be extended too long.
4. Rest periods must always be instituted in order to give the tissues time for recovery and to give nature an opportunity for repair.

These general rules for treatment are nearly identical with Mershon's principle of treatment in steps. The latter differs from my own postulation of *gentle intermittent forces*, only in the respect that in my treatment the intervals are much shorter, while the rest periods for the tissues are much more frequent. This difference is equalized in Mershon's treatment by the use of the most gentle forces which act continuously over a long period of time, while the rest periods are also long.

The opinion of Oliver²³ coincides with mine almost entirely in this question when he says: "In producing tooth movement we must have harmony in function, and harmony in function is nature's method of retaining teeth."

"If we move a tooth through the stimulation of the orthodontic appliance faster than normal growth can take place, we are creating disharmony. Oppenheim, in his work, has shown that by heavy pressure there is produced a compression of the blood vessels in the periodontal membrane. This is a manifestation of a positive disharmony. *If the teeth are tipped in moving, it is a sign that growth is taking place faster than normal development*, and we are establishing another disharmony in functional adaptation of the teeth and surrounding tissues. In other words, we are destroying nature's method of retention."

"The pressure of an appliance on a tooth is an unnatural and not a normal or physiologic stimulus."

During treatment the teeth should be exposed as much as possible to functional stimulation, in order that they may not be forced to move only along the straight and narrow path prescribed by the appliance. "There should be several periods during the treatment of the case when the mouth should be entirely free from appliances."

Also the late Hawley, one of the most successful orthodontists, accepted on the strength of clinical experience the same viewpoint. As early as 1905 he propounded for orthodontic practice the following principle²⁴ that it is prerequisite for the avoidance of pain to control the force in such a way "that its power does not exceed that which is necessary to excite and to continue the process of absorption. . . . The movement of a tooth should be carefully and ac-

curately planned, and when once started should not be relinquished except for rest until the tooth is in the required position."

Often we are able to notice an unbelievable improvement of the condition after a rest period. One of our greatest mistakes is that of interfering too much, of overestimating the value of our assistance. Experienced clinicians have often made the observation that many cases of severe malocclusions, which for some reason or other did not undergo treatment "in time," show, untreated, after a period of several years a normal, even an ideal occlusion. In many cases, it is simply a matter of experience and careful observation, or a matter of conscience to decide whether treatment should be instituted or not. Too seldom do we consider whether we may not sometimes cause harm by orthodontic treatment. We always believe that we will do good. Too seldom do we consider that *every* appliance, be it ever so gentle, constitutes a stimulation which transgresses physiologic limits.

For a long time it has been a recognized principle in medicine that the first duty of every physician is: *not to do harm (primum non nocere)*. But this principle has not yet been sufficiently recognized in orthodontia. Mershon²² gives vent to the idea in the following words: "Growth is a very tender and a very delicate process, and it takes very little to change the balance of the scale for good or for evil. We speak of the delicacies of the appliance; think of the delicacies of the cells of the human organism."

A. L. Morse (Boston) has set out in a very interesting paper to answer the following inquiry:²⁵ "The question is, Does the universal plan of continuous treatment conform to the rules and regulations of physiologic development?" He answers this question in a negative sense. He states that the fact cannot be disputed that growth is not continuous but intermittent. He further asserts that we do not know these periods of growth and therefore that we are unable to synchronize our treatment with these periods. Nevertheless, he claims that in continuous treatment without intervals we lose the great advantage that this fundamental quality may express itself without the restraining influence of our appliances.

Based upon observation regarding the ossification of the bones of the hand, Howard²⁶ demands the insertion of long rest periods, and he adds that "a knowledge of retarded or accelerated periods in skeletal growth is of the greatest importance in determining the time for 'rest periods' during treatment."

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ADENOCARCINOMA OF THE HARD PALATE*

REPORT OF A CASE

CONRAD C. GILKISON, D.D.S., CLEVELAND, OHIO

Division of Dental Surgery, Cleveland Clinic

THIS case is being presented because it may be of interest from a diagnostic standpoint.

The patient, a woman, had sought medical advice at the Cleveland Clinic on several occasions. She was forty-five years of age at the time of her first visit in 1926, when she had been suffering from cholecystitis and cholelithiasis, for which cholecystectomy was performed. At that time the eye examination revealed also early lens changes of the equatorial type and a serious refractive error. She returned the next year and was treated for a functional gastric disturbance.

In November, 1931, when the patient again returned to the Clinic, she had had pain for three months in the region of the maxillary molar teeth and of the hard palate on the right. There had been swelling on the right side of the hard palate about two weeks before she came. This had been lanced elsewhere about a week before, but there had been no evidence of pus or bleeding, and the swelling had persisted. The teeth in the region affected had been repaired without any relief from pain. There had been no evidence of infection in the nose or throat, and the patient did not complain of deafness, tinnitus or vertigo. She did think that vision in the right eye had been impaired since the onset of the pain in the right jaw. She had occasional headaches, but had had no head colds, sore throat, tonsillitis, or quinsy. There had been no nasal obstruction or discharge, and there was no history of hay fever, asthma or sinusitis.

The general physical examination revealed no significant abnormalities, except for the swelling in the mouth. The patient was referred to the dental department for examination of the mouth and for intraoral roentgenograms. The maxillary left premolar was devitalized and the mandibular left molar had a full gold crown, but neither showed roentgen ray evidence of infection. All the other teeth responded to the vitality test. Gingivitis was quite marked in the maxillary right molar region due to malposition of the third molar. The maxillary right first molar showed extensive restoration, but was vital. There was an extensive swelling on the right hard palate posteriorly, which, as already mentioned, had been lanced without relief. It was felt that the maxillary right first molar tooth and the area of gingivitis in this region might have something to do with the swelling. A roentgenogram showed some bone destruction in this area. The roentgen ray examination also revealed a small portion of root in the maxillary right premolar*region; removal of this was advised.

*Read before the Western Reserve Alumni Assn., June 9, 1932.

The ear, nose and throat examination showed that the nasal septum was deviated to the left, with some obstruction and crusting of the mucous membrane on that side. The right antrum was dark on transillumination, but all the other sinuses were clear. The tonsils were small and submerged, and no pus or débris could be expressed. Examination of the vocal cords revealed nothing abnormal, and of the ears, showed the canals to be clear and the drums bright. The hard growth on the posterior hard palate was noted as being about



Fig. 1.—Swelling right hard palate. Small denuded area in center where previous incision had been made.

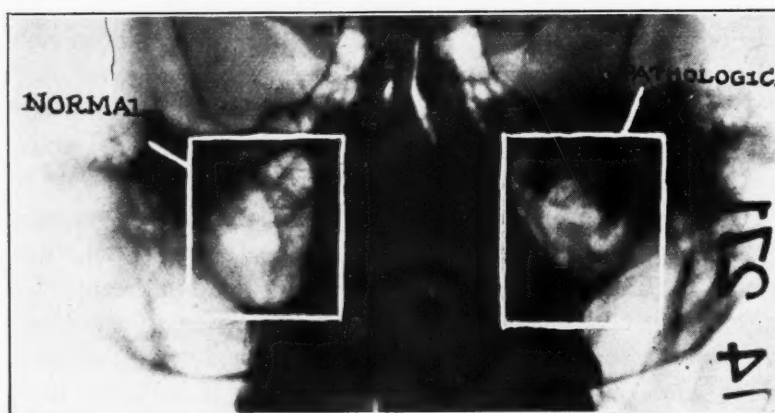


Fig. 2.—Roentgenogram of sinuses—left normal, right shows evidence of pus or granulation.

the size of half a walnut and as having a small denuded area in the center. (Fig. 1.) It was tender, but was not inflamed. Roentgenographic examination of the sinuses revealed the presence of pus or granulation in the right antrum; all the other sinuses were normal. Roentgenogram of the right orbit gave no evidence of abnormality. (Figs. 2, 3 and 4.)

From the general examination and from the special investigations, dental, roentgenoscopic and otolaryngologic, it was quite obvious that there was some neoplastic growth which involved the right antrum and the hard palate. A biopsy was done.

Gross pathologic section showed the tissue to be light reddish gray, somewhat irregular in outline, and very cellular. The microscopic examination revealed that the tissue was covered on the buccal surface by thickened, stratified, squamous epithelium showing no evidence of neoplasm. Below the epithelial surface, in the underlying tissue, there was a fairly well circumscribed, non-encapsulated alveolated tumor mass, composed in part of irregular, atypical tubular or glandular structures, and partly by solid masses of closely packed



Fig. 3.—Roentgenogram taken through hard palate.



Fig. 4.—Photograph of model.

cells of uniform type, not forming glands, keratohyaline material, or pearls. There was considerable hyalinized stroma throughout the tumor mass. The pathologic diagnosis was adenocarcinoma. (Figs. 5 and 6.)

Comment.—This case was referred to me as one of dental alveolar abscess, and this diagnosis might readily have been attached to the condition. The lesion might have been mistaken for an acute abscess, due to extensive restorations in the premolar and molar area, or to the marked gingivitis in the molar region.

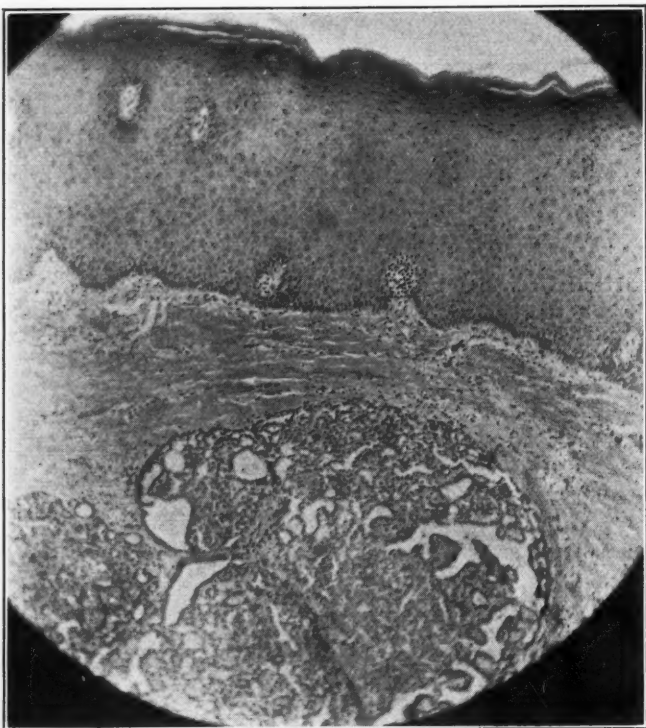


Fig. 5.—Photomicrograph showing invasion of tumor mass ($\times 100$). Buccal surface is stratified squamous epithelium. Below this is nonencapsulated alveolated tumor mass.

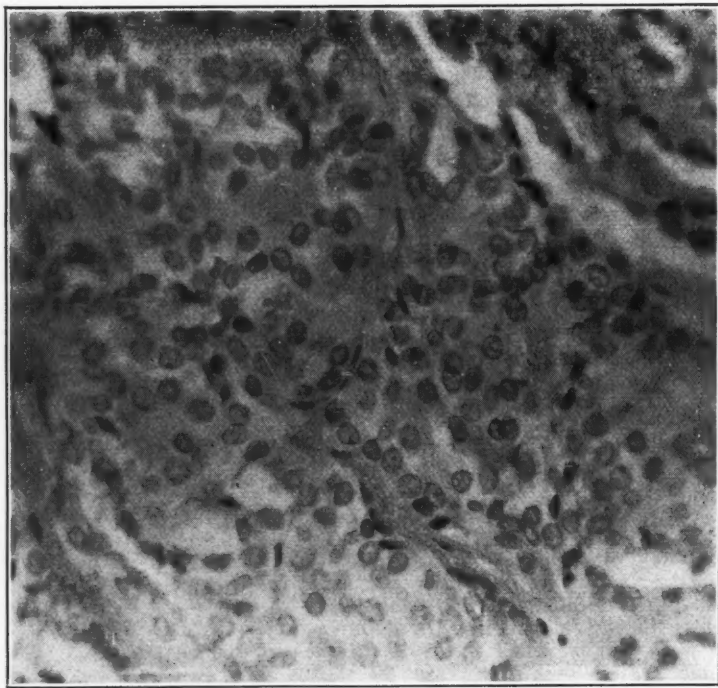


Fig. 6.—Photomicrograph showing atypical tubular or gland structures and solid masses of closely packed cells. There is considerable hyalinized stroma throughout the tumor mass ($\times 500$).

There was the possibility that the malposition of the third molar had something to do with the swelling. It might also have been an acute abscess of obscure etiology, or trauma might have been a factor in its causation.

It is of great importance to the patient that the proper diagnosis be made before any extractions, operations or curettement are done. Most of the cases of this type that have been seen at the Clinic have not been recognized early, and the patients have had extractions or minor operations before the proper diagnosis was made. I believe that far too many teeth are extracted for pain, without due consideration of the many other factors that may be involved.

FURTHER THOUGHTS ON READING "ETIOLOGY" BY BRASH

J. SIM WALLACE, M.D., D.Sc., L.D.S., F.A.C.D., LONDON, ENGLAND

IN THE June issue of the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN, Dr. W. W. Woodbury quotes a sentence from my communication on "The Progress in England in Elucidation of the Mode of Development of Normal and Abnormal Jaws, and of the Etiology of Irregularity and Malocclusion of the Teeth,"* in which I contended that "Through careful and patient investigation, we have arrived at the etiology of the various types of irregularity which will bear comparison with the solution of other biologic problems which are generally accepted as correct by scientists." Commenting on this, he says, "Surely one is entitled to ask for the evidence on which such a surprising pronouncement is based." I might of course refer him to my recently published book on *Variations in the Form of the Jaw, With Special Reference to Their Etiology and Their Relation to the Occlusion of the Dental Arches*. As there are two hundred and sixty pages in this book and ample references are given, and as apart from what others have written Dr. Woodbury's compatriot, Dr. George Grieve, said this book "would sooner or later be recognized as one of the most outstanding contributions to the subject up to this time,"¹ I might claim from this alone that I was justified in making the pronouncement referred to. It is not, however, my intention at present to recapitulate the evidence therein contained. It has been open to Dr. Woodbury to peruse for the last five years; though he never seems to have read the book. Brash, however, certainly has; yet though he disagrees with me on some points, he acknowledges his indebtedness to my book which he says is "greater than may appear from further direct reference." There is nothing surprising in noting that Brash disagreed with some of my contentions, for in my book I exposed the complete untenability of the theory which he propounded in the first series of Dental Board Lectures, in 1924. I do not know any orthodontist, dentist, or anthropologist who ever believed in the theory referred to, and evidently Brash has given it up himself and abandoned the attempt to formulate the theory of the mode of the production of irregularities, or for that part the cause of their widespread prevalence. Instead, he has advised us to be inspired with the provisional hypothesis that irregularity and malocclusion are inherited conditions!

When the etiology of a disease is obscure, it is easy to fall back on heredity and give it as an explanation, but as I contended some thirty years ago, with regard to a certain type of irregularity "the allegation that it is hereditary in certain families is, of course, no explanation. It merely amounts to saying that we don't know what produced it in the parent and the very same thing produced it in the child."² This, however, does not seem to be an etiologic explanation of

*Read at a joint meeting of the Central Counties Branch, the Oxford Section, and the Shrewsbury Section of the British Dental Association at Birmingham, Jan. 22, 1932.

the widespread prevalence of irregularities in civilized countries. Dr. Woodbury thinks what I say is a "surprising pronouncement." Nevertheless, to those who were even moderately acquainted with my views on the subject, the statement seems to have elicited no surprise whatever. Like Dr. Woodbury's communication on Brash's "etiology," mine was published first in America.³ I sent it for publication before reading my paper at Birmingham, and so the discussion did not appear. This, however, brought out quite a number of interesting points, and its publication now will subserve not only the purpose of showing that the statement I made was not a "surprising pronouncement," but also that there was general appreciation of my contentions.

In opening the discussion, Mr. Humphrey F. Humphreys said: "The paper was very largely a discussion of another book. It centered mainly in a criticism of the views expressed in the Dental Board Lectures and subsequently published by Professor Brash, and I do not feel able to butt into this controversy with any confidence. I think most of us will agree that Dr. Sim Wallace has established the fact that function and proper use of the jaws are of very great importance in preventing, and to some extent (as the work of Dr. Rogers of America shows), correcting such deformities. The question of real interest is whether that is the whole story. I must confess that in endeavoring to follow the copious literature on this subject, and from my own observations, I am inclined to agree with those who think that there is at any rate some other factor concerned; informed opinion shows a tendency to assign the onset of teeth crowding and deformed jaws to an even earlier age in life. When I was a student, one was taught it did not occur in the deciduous dentition and only occurred with the eruption of the permanent teeth, but one cannot ignore the great body of evidence that has been produced showing that the onset does arise much earlier in life than was formerly supposed. It was this consideration that led Professor Brash to suggest that the causes of modern deformed jaws should be looked for in a study of heredity. I agree with Dr. Sim Wallace in that the pushing back of the onset of these conditions to a very early period in life does not necessarily lead to the conclusion that they are hereditary; otherwise we should have to say that things like rickets, or diseases of infancy were due to heredity. But they do show that causes are operative, possibly in the prenatal months, though I am not very much impressed by the evidence for that—but most certainly in the early postnatal period. Sir A. Keith has shown that the jaws of civilized man are changing, and that we do tend to inherit a different type of jaw. How these changes have been brought about leads us to difficult questions, but Keith's work does show that we are not born with the same chance of developing in every case a fully formed jaw, adequate to house its teeth, as was formerly the case. We are dealing with a definite disharmony between the size of jaw and the number of teeth. I have no idea what is the chief cause of that disharmony; we can agree with the lecturer that functional use of the jaws in early life has a great deal to do with it. However, the Anglo-Saxon skulls from Bidford in our Museum show signs of excessive attrition, so much so that the teeth became almost worn out between the ages of thirty and forty years. None the less, many cases of small irregularity are there, and if some

slight irregularities exist where there are no signs of deficient but every sign of excessive use, then I am inclined to think that some factor other than inadequate functional use must be involved. That does not, of course, prove that this factor is strictly hereditary. I feel there may yet prove to be some factor in early life, possibly connected with derangements of the glands of internal secretion or faulty methods of infant feeding, that may prove to have a bearing on this problem, and one hopes that in the next few years further research will throw light on these questions. Who could have expected that the rival theories on rickets, one that it was due to errors of diet and the other that it was due to lack of sunlight, would have been harmonized in the unexpected way in which they were harmonized by the discovery of vitamin D as the vital factor? So we still hope for further light on the great modern increase of these dental deformities which may harmonize the conflicting views we have heard discussed tonight."

Continuing, Mr. Cale Matthews said: "If Colonel Humphreys felt any diffidence in accepting the invitation to open the discussion on Dr. Sim Wallace's paper tonight, you can imagine how very eager I was to hear the attitude he took toward the paper. It is a subject that has been more usually brought forward at Meetings of the British Society for the Study of Orthodontics, and Sim Wallace, Keith, Campion, Thomson, Elliott-Smith, Brash and many others made their contributions almost always from different points of view. Dr. Sim Wallace's scientific knowledge, apart from his dental reputation, makes discussion of his paper an extraordinarily difficult thing. It amounts to an emphatic disagreement with Brash's thesis on many points, and the most serious I consider being those almost entirely due to a different point of view. The one man is an anatomist; the other, a physician, and a practicing dentist with vast clinical experience. The one dealing with dry bones and skeletons, the other dealing with living tissues. If Wallace entirely relies on the environmental attitude as opposed to heredity, will he include in his environmental conditions the imitative faculties of the growing child? As a practitioner, it has been brought home to me on very many occasions the marvelous results of development through the imitative faculty of the child in the association with its parents or guardians or nurses, suffering from marked developmental deficiencies. Surely, as we have been told tonight, the hereditary factor may be there originally, but it may be prevented or corrected by environment establishing complete and proper function. From my experience as a practicing orthodontist, I do not think I should like to ignore entirely the hereditary factor. I think that possibly one of the weak points in Brash's thesis is that so many of his conclusions were drawn from abnormalities, such abnormalities as the ordinary practitioner and student rarely see; some of them never see, and, as the essayist says, 'some of them fortunately have not the opportunity of transmitting their peculiarities.' . . . A question which is rather amusing, but has been impressed upon me for many years, and on which I had a long talk at the Orthodontic Congress in July, is that of the 'open window.' You may remember that a year ago there was a letter in the *Daily Mail* on the question of the 'open window' from a layman, and he showed how every animal, except the human, breathes

warm air when asleep, curls his head under him; the bird puts his head under his wing, and the human being is the only thing that does not, for at birth the child is taken from its mother's arms by a nurse and deposited in a cold bedroom with the windows wide open. There is some prominent cause for the increase of adenoids in the present century. This man condemned the 'open window,' but his concluding remark was 'I shall sleep with my window open.' I think this is the attitude that concerns us." Mr. Cale Matthews also commented on the fact that growth in *length* of bone apparently was independent of functional activity. I noted this about thirty years ago, and explained why it did not alter my thesis as regards the development of the *jaws* (The Irregularities of the Teeth, pp. 5-7). Continuing the discussion Dr. Brailsford said: "Mr. Humphreys has mentioned the question of rickets, not perhaps as being the cause, but I think that it is conceivable that rickets may have an influence on some of these developmental irregularities. I make x-ray examinations of something like a thousand babies at the age of about one, every year. I do them for the Infant Welfare Centers in Birmingham, and there must be between one hundred and two hundred cases of rickets every year. Many of those babies do not show the obvious clinical signs of rickets, and it is conceivable, I think, that this condition may have some influence in the developmental irregularities because rickets are associated with very definite softening of the bone. You see very marked deformities of all the long bones—pelvis, etc.; and one can think it possible that during that plastic stage of the bone there may be some irregularities laid down.

"Then Mr. Cale Matthews has touched on the question of the atrophy that occurs from disuse. There is no question, from the radiographic point of view, that that occurs; how, if only one sees a limb that has been put in plaster as the result of a fracture, in the course of a week or so considerable rarefaction of the bone has taken place, and if that limb is out of use for any time, you find the bones of the limb are definitely more slender on that side than on the other. If you compare the femur of the hip joint of patients with congenital dislocation of the hip, you find that on the side which is receiving most use the femur is a good sound femur. The other may be well developed as far as shape is concerned, but it is altogether a more slender bone. It is not receiving normal function. The size of it depends upon the amount of function that it is having, and if you compare any radiograph of any limbs which have not for any reason been used, you will find this poor development of the bone on that side."

Mr. E. Vaughan Tomey said: "I remember the last time that Dr. Sim Wallace came to Birmingham, and I think he shares with Mr. Lloyd George the good fortune of escaping from Birmingham with his life. At that meeting we had a large number of Public Health Visitors, and Dr. Sim Wallace then laid down a definite statement that, in his opinion, the opening of windows and 'fresh air at nighttime' had a great deal to do with the cause of adenoids and tonsils, and the mass of blue-uniformed Health Visitors rose up against him and were extremely indignant. I notice tonight, that in his paper, he still mentions this one factor, that cold air at night might be a cause of the

maldevelopment of the jaws. With regard to that I have just had an interesting case. Four children were brought to me; the eldest three children had been operated on for tonsils and adenoids, and the mother said she was very particular in having the windows wide open at night. The fourth boy suffered from asthma, and unfortunately, the mother said that they were not able to have the windows open. That child was the only one who had not been operated on for tonsils and adenoids, and I immediately thought of what Dr. Sim Wallace told us some years ago in Birmingham.

"Dr. Sim Wallace has brought to us tonight hope. After listening to Professor Brash's series of lectures, we had none; Professor Brash led us along certain ways; he led us, first of all, along a lane with a signpost 'Vitamins,' and after a long lecture, and one very difficult to follow, because he had the power of using very long words, each word being in itself a definite sentence, he led us along this lane only to find at the end of it that we came to 'No Thoroughfare.' And then along the lane of 'Endocrine Balance,' and at the end of that lane, after listening very carefully, one came to this barred gate, 'No Thoroughfare.' And then along the lane 'Calcium Metabolism,' and the same thing applied until one really became despairing and hopeless. And then, finally, a lecture on heredity, which, according to Professor Brash, is the only one factor which counts. Now I think nothing could be more discouraging to a dental surgeon than that final lecture.

"Later on we had some films shown to us of Dr. Rogers' work, by Mr. Cale Matthews, and he showed us quite definitely that the jaws could and did develop by continued use. By proper use, the jaws were made to develop, and Mr. Cale Matthews showed us films taken of children at different ages, and we were quite convinced that the factor of use and function had a great deal to do with the development of the jaws, and that factor, coming after those lectures, helped us to think that perhaps after all Professor Brash might not be the last word.

"With regard to the eskimo, I think there is one factor there. The children in the past did have a habit of chewing the blubber from the seals, and that was given to them as a sort of pap, sort of dummy that European children have, and the mastication of this blubber did afford heat-forming food and at the same time undoubtedly had to do with the development of the jaws. Now that they are becoming civilized I expect they are taking to dummies, and hence the alteration in development which has been noted.

"From Dr. Sim Wallace's lecture tonight I think we can adduce that there are three main factors in the development of the jaws. I think that first of all we have to give Professor Brash credit for *heredity*, and then I think, second, is *use and function* and, third, comes *correct feeding*. I suppose Dr. Sim Wallace will want to change the order of these about, and put *feeding* first or second instead of last."

In replying to this discussion on my paper, I said: "Mr. Humphreys, I gather, agreed with me that lack of function could be taken as a factor in the production of irregularities. Similarly this was agreed to by Dr. Brailsford, Mr. Cale Matthews and Mr. Tomey. So far we are all in agreement. But

Mr. Humphreys said that there were other things which might cause irregularities. Well, I certainly recognize that there are other things; disease is another thing. I mentioned caries and the loss of teeth being rather conspicuous in causing irregularities, but Professor Brash seems to think that these are not of any appreciable importance as an etiologic factor.

"I referred also to blockage of the nose. Well, that is another thing, too, which Professor Brash lightly brushes aside. During the last twenty years we have come to recognize that the causes of malocclusion often operate at a very early age. One point to which I have referred indicates that the troubles may begin almost immediately after birth. I know of a child who breathed and slept with his mouth shut the first day of his life; but no doubt on account of being compelled to sleep with the window open, the second day of his life his nose was blocked and for years afterward he was a mouth-breather. He could not be induced to gnaw as other infants do, and you will not be surprised to hear that he developed postnormal occlusion. There is no evidence, as far as I know, that the irregularities of the teeth in general come about from causes prior to the first day of life.

"There is still another thing I think of a pernicious nature introduced by the medical profession, and that is the separation of the child from its mother immediately after birth. This is quite unnatural. It is quite impossible to keep an infant in a cot as snug as it would be in its mother's arms. The practice is altogether due to a fiendish craze for fresh air at any time. Fresh air is quite excellent when it is moderately warm, but if it is cold and damp, it is not always beneficial. Consider the mortality statistics. I remember reading about a thick fog in Glasgow which lasted for a fortnight; pneumonia and bronchitis soon became prevalent and there was a great rise in the death rate. People ought not to be obsessed with a craze for fresh air in all weathers and at all ages.

"Then, I think Mr. Humphreys also indicated that somehow or another the views of Professor Brash might be harmonized with mine. They will be, no doubt, when he recognizes the value of *liberating stimuli*, of *functional activity* and of the *effect of diseases*, more especially of those which interfere with function and the growth of bone.

"Now in regard to heredity, a remark was made tonight to the effect that Professor Brash had looked at the subject from a different point of view. I am afraid Mr. Cale Matthews does not know exactly the origin of my views. I happened to be particularly interested in heredity and in the diminution of the size of the jaw, before I took any special interest in the irregularities of the teeth. The irregularities of the teeth certainly came to interest me as I saw them, but I originally approached the subject from the point of view that Professor Brash approached it, that is from a study of dry bones and heredity, because I was, at first, ten times more interested in the question of heredity than I was in the clinical aspect of the subject. I was puzzled to know why jaws seemed to be growing too small for the teeth. It seemed a very ridiculous thing that the jaws should not be appropriate in size to the teeth, and inconsistent with conclusions based on the study of heredity and evolution. At

one time I kept a mandible in my pocket and often gazed at it intently to try to find out what on earth it could be that gave rise to our troubles. I could not find out anything from the study of the dry bones. It was later, when I was thinking about caries, that it flashed over my mind that we were not using our tongues and our masticating organs enough, and that this factor in the causation of caries was also a factor in influencing the development of the muscles of mastication including the tongue, and then I thought that if we had a bigger tongue, together with larger and stronger muscles of mastication, we would have correspondingly better developed jaws. Thus, I really originally approached the subject from the same point of view as Brash; after I found its uselessness, I approached it in a different way.

"I must repeat, however, that I do put importance on heredity; it always ultimately counts for something, but I do not think that we can dissociate environment from heredity. There is a suitable environment for every animal. Take away that proper environment and things go wrong. Physicians and civilization have taken away the correct environment for children, and consequently we are liable to get malocclusions and other troubles which in an appropriate environment would not eventuate. If, as Sir Arthur Keith and others have thought, there is some mysterious factor in addition to those factors we already know about, which gives rise to a want of full development of the jaws, he never explained it; he never told us what it was, he vaguely spoke about acromegaly resulting from disorders of endocrine glands, but he never indicated why these disorders should have arisen or why they should be increasing among civilized people.

"Consider the eskimo; are we to believe with Sir Arthur Keith that there is some mysterious thing working to produce a jaw that will not serve its purpose? How is it that this just comes about at the time that you introduce soft feeding and doctor's orders such as 'Keep the window open night and day in summer and winter; do not let the child gnaw a piece of leather or anything else, because such things may be dirty and contain germs,' and so on? Surely we should, as far as practicable, allow children to exercise their normal instincts, and provide them with what are recognized to be liberating stimuli. The fact that the eskimo children did get these developmental stimuli has been mentioned by one or two speakers. Why should our children not be given a civilized substitute? I may be wrong; I have been wrong—only once or twice!—but why not put it properly to the test?

"I am not asking you to take for granted anything I have said. I do ask you, however, to study both sides of the question—I am not in the slightest afraid of what will be your verdict."

Thus ended the discussion in Birmingham, and from a perusal of it it will be observed that not one of the speakers really disagreed with me. Nor was the slightest hint of surprise expressed with regard to what Dr. Woodbury called my "surprising pronouncement." Further, if there was any belief in the so-called "etiology" of Brash before the delivery of my paper in the very town in which he taught from his professorial chair, there certainly was little, if any, after the debate closed. Indeed it was pretty evident to all that Brash had been caught out for the second time. If he likes to try again, I

have no doubt the columns of THE INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN will be open to him to try once more to demolish what we orthodontists, "through careful and patient investigation, have arrived at."

As a postscript, let me say that Brash and I do not disagree with regard to the fact that *certain* irregularities of the teeth are inherited and cannot be prevented by environmental influence. The point, however, that is really of importance is whether in general the vast majority of irregularities of the teeth which we see in civilized communities (say nine-tenths) are the result of environmental conditions and dietetic errors imposed on us or our children which could be corrected so that irregularities might become as rare as they were before bottle feeding, pap feeding, and environmental conditions which tend to produce mouth-breathing, came into vogue. Let me say further that since Brash wrote he has another difficult nut to crack in what has recently been brought to light with regard to eskimo children and the inhabitants of Tristan da Cunha. In this island the people are of civilized European stock, and the children are breast fed up to the age of about sixteen months. Their food is said to be of the "coarsest description"; the cusps of the teeth are worn down; the incisor teeth in later life bite edge to edge; the doors of their houses are generally open by day, but the windows are built in, so that they cannot be opened at night; nevertheless, or rather consequently, irregularities of the teeth are almost unknown. These facts should also make Sir Arthur Keith try again, for his predetermination theory of the diminution of the jaws and consequent irregularities of the teeth in civilized countries is rudely negated.

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THE PSYCHOLOGY OF ORTHODONTIC TREATMENT*

SIR NORMAN BENNETT, M.B., B.CH., L.D.S., LONDON, ENGLAND

IN CHOOSING a title for a paper, the more logical course is to decide on one as nearly descriptive as possible, after writing the paper, but as I was pressed to give a title when I had only vague notions in my mind of what I was going to say, I found when I came to think the matter out, that I could not live up to the title, and I must ask you therefore to pass over its seeming magiloquence and listen as patiently as may be to the ordinary ideas which I propose to place before you.

When an orthodontist is contemplating the treatment of a case, there are many factors that he has to take into consideration: his own attitude toward the child, the child's character, the character of the mother, her relations with the child and her estimate of the value and difficulties of orthodontics, the nature of the abnormality, its diagnosis and prognosis, the age of the patient, physical development of bone and muscle, the condition of the teeth and gums, nasal obstruction, and the school arrangements of the child and the probable attitude of the school authorities. Now all these considerations are dealt with in textbooks on orthodontics, and the largest amount of space is quite rightly devoted to the more strictly orthodontic part of the problem and closely related factors, because the varieties of abnormality and their causes are so great and so numerous that much space is necessary for their description and elucidation. The other factors are usually polished off in a page or two. We are told that it is no use to attempt treatment unless the child is amenable, and that the mother's cooperation must be secured, or her interference prevented, and so forth. But the amount of space devoted to different aspects of the orthodontic problems must not, I think, be taken as a measure of their relative value. What I want to put before you is that although correct diagnosis and schemes of treatment are of vital importance, in a large number of cases it is, or should be, the child who carries out the treatment, and success or failure depends more upon obtaining its cooperation than on any other factor. We may think of individual teeth, and the movement which it is desired to effect. We know that a given pressure in a given direction will produce a particular result. The problem is how best to apply that pressure, and to maintain it, or reapply it when tooth movement has abolished it. We should all like to have our patients under constant supervision, so that the little adjustment necessary from time to time might be given when it is immediately required, but in my experience this is almost always impossible. It often falls to my lot to decide whether it is worth while to treat children who live out of London, who are away at boarding schools, and who can only come to see me occasionally. In most of such cases much can, I think, be done, and it is usually worth while, provided the interest and the cooperation of the child can be se-

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cured. By this I mean much more than taking advantage of the tractability of the child. Most appliances need adjustment; one may often enlist the help of local dentists with advantage, but I am afraid that this assistance sometimes proves a broken reed upon which to lean. I prefer to use an appliance which the child can adjust, and in making up my mind what sort of an appliance I will use, I have this in mind as the chief determining factor. It is not difficult to move teeth, and there are many ways of moving them, but it is difficult to arrange and ensure that the force necessary for movement shall be applied to the correct degree at the right moments. To get this done by the child implies a great deal more than taking advantage of the amenability produced by parental training. It means making friends with the child and inducing in the child's mind more than a mere willingness to carry out instructions, rather a desire to attain success, and a feeling of reluctance to return later and allow it to be discovered that little or nothing has been achieved. Children have receptive minds—they are often quicker at understanding what is to be done than their parents. They are usually very adaptable and will wear even uncomfortable appliances put in the mouth, but anything less than complete honesty and frankness in dealing with them is worse than useless. It is of no use to tell a child that an appliance put in for the first time is not uncomfortable because the child and the orthodontist both know that this is untrue, and each knows that the other knows; but if you explain to the child that it will not hurt, or ought not to hurt, and that if it does he must come and tell you; but that it will be uncomfortable for three or four days, and that after that he will not mind it a bit, then his pride is called upon, he discovers that you are telling the truth, and you have gone a long way to ensure adequate cooperation. I daresay these ideas are all platitudes, but I think this psychologic factor in orthodontic treatment is often neglected. If the operator and the child are sympathetically imbued with the will to succeed, then given a sufficiency of diagnostic accuracy to prevent attempting the impossible, and of technical skill, a reasonable measure of success is almost assured. This perhaps rather borders on the mystical. It is, however, believed by many people that in cases of severe illness, the will to recover is an important factor. This idea is often utilized by popular novelists. The heroine at her last gasp in the last chapter is just able to recognize her lover who has returned from the other side of the world just in time to assure her that she was quite mistaken in thinking that he had gone off with the other girl, and she promptly recovers. But I think it is not only in novels that such things happen. Depressed or morbid mental states can apparently produce physical changes, and determined optimism may help to promote recovery from illness. I am not proposing to argue that will power will move a tooth from one part of the mouth to another, but on the other hand the application of the force is but the instrument or agent, and I am not prepared to admit that the chain of events from the directive mind of the orthodontist through the child's mind and will, and the control of appliances, ending in the movement of a tooth is a purely mechanical one. I shall presently give examples of methods of treatment in which the child's will is quite definitely the determining factor in success.

Now, as regards the mother (it is usually the mother that we have to deal with), I think that her part has for the most part been finished by the time she

brings the child to the orthodontist. As a rule, but not always, you may judge pretty well what the child will be like if you know the mother. Early training—very early training—is of vital importance, and a hopelessly spoilt child may be given up at once. I have one such child in mind. She is wearing a simple appliance to raise the bite. When I say wearing, I mean that she wears it when she feels inclined. The mother recently said that it was difficult to bring the child up from the country sufficiently often, and might she go sometimes to the local dentist. I managed to dissemble my joy sufficiently to say in a matter-of-fact tone that I should be glad to write to the local dentist. Conscience and professional sympathy compelled me to warn him. Fortunately very few children are like that, because the modern well-educated young mother is much to be admired. Her affection is tempered by common sense, she is keen about the physical development of her children, she knows that there is no easy road to success, and she trains her children to have the same self-control that she has acquired herself, and to see things through. This is what I mean when I say that her work is largely done by the time she brings the child. Her assistance will still be valuable, but the relations between the orthodontist and the child should for the most part be direct, and not through the mother as an intermediary. I attach much importance to that. For example, when mailing a removable appliance I always address it to the child rather than to parent or schoolmaster. This is a small matter but I think it counts. As an example of what can be done by the modern mother in creating in the child's mind a favorable attitude toward the dental surgeon, let me tell you a little story. A patient whom I have known since she was a little child has two children, a boy and a girl aged seven and five years. I have never seen them because they have until lately lived in the north of England. The other day the mother was coming to town to see me, and the little girl announced that she had toothache; on inquiry this seemed to be rather vague; the small boy concluded the matter by joining in the conversation and saying to his sister, "I know what you want; it is just an excuse to go to London with Mummy and see Norman the dentist." General inferences may be drawn from this story, but the one I want to emphasize is that the mother had done her share in trying to make her children amenable patients.

As a contrast to the difficult child that I mentioned just now, let me tell you of another, an extraordinarily nice boy whom I can only see very occasionally—he lives in Devonshire and was at school in Kent until recently. He arrived the other day with a Badcock expansion plate in two halves, and explained to me that by sticking the end of the screw into the tube he could jam it home in his mouth and it would hold all right. Fortunately the two halves were connected with a labial wire, which I usually use because I dislike the children to swallow or half-swallow their plates. On another occasion he wore a broken mandibular retention plate in two halves, and surrendered it with reluctance to his mother, when she visited him at school, to send to me to repair. Of course, with a boy like that, to fail would be almost a proof of incompetence, and it is with relief that I venture to tell you that the case promises to be a success.

I said just now that it would be unwise to estimate the relative importance of different factors in orthodontic treatment by the amount of space devoted to

them in textbooks. Similarly, the length of description of the various kinds of abnormality of position affords no criterion of the frequency with which we meet with them in daily practice. Let us consider them from that aspect. Take first of all the abnormalities due to local causes, such as retained deciduous teeth, teeth of abnormal form, supernumeraries, absent teeth, abnormal frenum labii, total displacement in the crypt, impaction of the maxillary first permanent molar against the second deciduous molar, and thumb- or finger-sucking. Now most of these things may be seen fairly often in hospital practice; some of them give rise to gross local deformity; others to very little. But in good class private patients such as through the waiting rooms of the members of this Society, they are rather rare. Deciduous teeth are removed before they can do much harm, and so are supernumeraries. Abnormal frenum is surgically treated, and thumb-sucking is not allowed. When we turn to the difficulties arising from premature loss of deciduous or permanent teeth the case is rather different. These occur fairly often. The deformities arising from loss of teeth anterior to the second deciduous molars are not usually very serious, though I agree that collapse of the arch may cause some difficulty. Forward movement of the first permanent molars is of course responsible for malalignment of the permanent teeth anterior to them. The treatment of such cases when uncomplicated by deficient bone development or error of occlusion, resolves itself mainly into a choice between moving the molars back again and extraction of premolars, and in most of such cases the wise orthodontist chooses extraction, because this treatment offers the opportunity of providing a good functional occlusion, and the individual tooth movement required is fairly easy, and can be effected by means of fixed or removable appliances in a short time, without the harm which is liable to result from prolonged treatment or movement through considerable distances.

The next class of case that we may review is that generally known as Angle's Class I, that is to say, malalignment of several teeth due to deficient bone development, sometimes known as "general crowding." I do not think that "general crowding" is a good term because it implies too much tooth, or too many teeth rather than insufficient bone. When we say that a bus is overcrowded we mean that too many people have got into it, not that the bus is smaller than usual. "General crowding" would apply strictly to the presence of supernumeraries, which are the real strap-hangers of the dentition. However, that is by the way. What we are considering at the moment is the relative frequency of these various conditions, and I think this particular one is fairly common in all classes of society, and sometimes presents difficulties in treatment greater than in the cases of occlusal abnormality to be presently discussed. They present difficulties in diagnosis, because they involve estimation of whether, what Lundström calls the apical base, is, or ever will be, large enough for a dental arch of anything like canonical form, and therefore whether extraction is necessary as part of the treatment. They are difficult in treatment because a considerable amount of individual tooth movement is often required and the space within which it can be effected is limited. It seems to me that it is in cases of this class that fixed appliances have an advantage over removable appliances when they are practicable on other grounds. Expansion is often needed and this can be done by means of either fixed or removable appliances. For my part, where the

patient is away for two or three months at a time, I prefer the Badcock screw, but that may be a matter of personal predilection. For the individual tooth movements, especially rotation, probably more definite and more certain results can be obtained by means of fixed appliances. I seem to be dangerously near the point of discussing whether fixed appliances are better than removable. Nothing is farther from my intention. I should as soon think of arguing that roast ribs of beef was a better diet for a rowing Blue than roast saddle of mutton. I believe that some movements are better effected by one and some by the other and that many other considerations come in for each case, which must be judged on its merits, and that the general predilection of the operator rightly counts for a good deal, because he is likely to achieve the best results with the method of his particular fancy.

This brings me to the large group of cases involving errors of occlusion not merely of individual teeth but of the dental arches as a whole. They include close-bite and open-bite, postnormal and prenatal mandibular occlusion, and lateral malocclusion. The last, commonly known as cross-bite, is rather rare, though not very rare. (I am not of course speaking of lateral malocclusion of individual teeth.) I think we may leave it out of the present count. Open-bite I have seen many times at hospital, but as regards private practice today, it scarcely exists. Its constant association with hypoplasia suggests that the particular defect in the calcification of the teeth and bone is due to a common cause which has become almost eliminated from children whose early nurture is on rational lines. Prenatal mandibular occlusion is undoubtedly rare, both in private and in hospital practice.

This brings me to what I have been leading up to for some time. Close-bite and postnormal mandibular occlusion are both exceedingly common, whatever the causes may be. I have not analyzed or counted my cases, but I hazard the statement that in private practice at least half of the cases that call for treatment by means of appliances are either close-bite or postnormal occlusion or both combined, and I propose further to try to show that in the treatment of these cases the psychologic element is or should be of very great importance.

Now, it will be generally admitted that the operation of raising the bite is or has been attended with a good deal of uncertainty. In some cases the bite rises beautifully in a few months; in others nothing seems to happen. Why? I believe that there are two essential conditions. One is that the bite should be raised on the mandibular front teeth only enough just to separate the back teeth. The other is that the effect is produced during mastication and practically at no other time. For these purposes I believe there is nothing so good as a removable vulcanite plate with a thin cast gold front properly occluded with the mandibular incisors. This can be slightly thickened as often as necessary; if it is properly used, it will almost always be effective, but success depends on the cooperation of the child, and therefore on the psychologic element in the case. I find it very difficult to understand how for this purpose (except on the ground that it cannot be removed) any one can prefer a sort of gridiron arrangement, which cannot be finely adjusted to the bite, and cannot be slightly increased in thickness without removal and much difficulty.

Again, in the case of postnormal mandible it will be agreed that the results, and the permanency of the results, vary widely. Good results can be obtained by means of either intermaxillary force or an inclined plane on a removable appliance, but I venture to submit the argument that the latter method is the more scientific. We know that some mandibles come forward or grow forward very readily, while others do not. Expansion of the maxillary arch or, in younger children, labial movement of the maxillary central incisors will sometimes effect such a release that but little further treatment is required. In others the mandible has to be persuaded, and many would say forcibly persuaded. I think we may consider here what is done in orthopedic treatment. I believe it is an accepted principle among orthopedists that as a general rule bony deformities are due to muscular weakness or lack of balance between opposing muscular systems; and that such a deformity as knock knees or scoliosis is best cured by remedying the muscular disability. It was found in the case of war injuries that the restoration of palsied muscles to functional activity could not be effected entirely by passive treatment, but that conscious effort on the part of the patient was necessary. So also in the case of knock knees, the surgeon attaches much importance to the conscious efforts of the child. Now, if there is a bone which is more clearly under the control of muscular effort than another, it is the mandible. We do not quite know what happens when the occlusion is changed, but presumably the normal growth of the condyle backward is accelerated. I do not think that the resting position of the condyle is permanently altered. However that may be, there is proof enough and to spare that the occlusion can be permanently changed, and I think there is no doubt that the mandible is brought forward. It has been argued that what really happens is that all the mandibular teeth move forward in the mandible, but surely that is contrary to all observation, and *prima facie* a more unlikely explanation of what happens than changes at the articulation. Now the question arises: How is the change best effected? There is the method of intermaxillary force, and the method of persuasion by means of an inclined plane. The former undoubtedly acts, but is it physiologic and scientific? It is a passive dragging in which the volition of the patient plays no part. The inclined plane on the other hand is merely a stimulus or a reminder to the patient to do his share. I have no use for large planes shod with gold which force the patient to bite into normal occlusion straight away or to bite not at all. They should be small, oblique in shape, and at the outset should only aim at bringing the mandible forward a little distance. I say they should serve as reminders, because an important factor in treatment is to create incisor consciousness in the child's mind and to induce him by voluntary muscular action to bring his jaw forward as much and as often as possible. I submit that results achieved by those means are more likely to remain permanent and more likely to be accompanied by compensating physiologic changes in the tissue than when they are obtained by any kind of external main force.

I must admit that I seem to be arguing in favor of removable appliances. That is not my object, for fixed appliances are of inestimable value for certain purposes. What I do say is that fixed appliances for the most part ignore the

psychologic element and the active cooperation of the patient; and for those forms of treatment so often required, such as for close-bite and postnormal mandible, not only can this factor in treatment be best utilized with very simple removable appliances, but the method may be regarded as more scientific, and the results possibly more permanent. I agree, however, that with very young patients one cannot expect the active cooperation that one looks for in older children.

There are two cases that I propose to show you on the screen. Both may be regarded as successes. They are not necessarily either exceptional or typical of my efforts. Cases are sometimes divided up into successes and failures. It seems to me that most cases come into neither category. Real failures under reasonable conditions should, I think, be rare, but for the most part perfect successes elude me. Orthodontic cases seem to me to have a queer way of doing very little for some time, then progressing rather fast, and then slowing down just when they seem near completion, and often never quite getting there at all.

Nevertheless, I should say that perfect success is not the criterion upon which judgment should be based. An immense number of cases can be greatly improved in one way or another. There is a growing demand for orthodontic treatment, and will have to be met either by a larger number of orthodontic specialists or by greater attention being paid to the subject by general dental practitioners, or by both means. I think that what perhaps frightens the general practitioner most is reading textbooks on orthodontics. Fortunately, in recent years there has been a movement toward simplification of appliances. I noticed with pleasure the other day that Mr. Cale Matthews, when demonstrating here, gave a short list of pliers, band material, wire, etc., and said boldly, "that is all that is necessary." The crucial test of the orthodontist is not the ingenuity displayed in devising complicated appliances, but the ability to obtain results with simple ones. The need for the student of today is to be taught as far as we know it, the causation and grouping of abnormalities of position, the principles of diagnosis, and the means and objects of treatment; the occasional difficult and complicated case should never be used for teaching purposes. He would then discover that 90 per cent of cases resolve themselves into a few classes, and are not so difficult after all. The choice of the broad lines of treatment is half the battle. Working against nature or striving for an artificial man-made idea is in my opinion to court failure, or indeed in some cases to obtain the sort of success which would have been better avoided. Until means are found for the prevention of the deformities with which we deal, there will always be room for the orthodontic specialist, but ideal occlusion and perfect alignment are but a vain dream for the thousands of children for whom much could be done by the general dental practitioner who had been taught the broad principles of diagnosis and choice of methods of treatment by simple fixed or removable appliances without prejudice in favor of either. Ability to form a sound diagnosis and to formulate a scheme of treatment and to estimate the possibilities of success, come with experience. Better results will be obtained by working on physiologic lines with simple appliances, than by attempting the creation of artificial arch forms by means of complicated ones.

DISCUSSION

Mr. J. H. Badcock said that Sir Norman Bennett had given the wise and humorous address, full of common sense, which they had learned to expect from him. What he had said about gaining the cooperation of the child would appeal to them all. If, as he had said, the treatment was to be left largely in the hands of the child, it must be on simple lines and of such a nature as the child could manipulate, and this was all the more necessary in this country because of the difficulties involved in the fact that the children who were their patients so largely, went to boarding schools, and it was only possible to see them at long intervals. With regard to the details of the paper, there were one or two points he desired to mention. One was with regard to Sir Norman's use of the biting plate. He thoroughly agreed with him that the biting plate should at first only keep the molars off each other, and should be increased by small stages, so that it did not interfere with the child's comfort or masticating power. There were one or two points he would like to discuss with him with regard to his treatment of Class II cases. Sir Norman preferred the inclined plane to reciprocal traction, because he thought that he thereby gained the advantage of muscular effort and will power on the part of the child. The speaker wondered to what extent that was true. If an inclined plane were placed in a child's mouth—he was speaking of those "inclined planes shod with gold," of which Sir Norman had spoken with such scorn—the effect was only got during mastication, exactly as with the biting plate. In the ordinary way a person's teeth were not clenched; they were kept apart, and he did not think an inclined plane had any action except when the child was eating. Sir Norman had spoken about bringing the jaw gradually forward. Supposing that the teeth had been brought to such a position that the child was able to bite either in the backward or forward position, he would have thought it was difficult for the child to have bitten at all in the intermediate position, and he took it that it was one of the essentials of the treatment that the arches should be brought into such a form that the child could bite in the correct forward manner, and bring his teeth together. That was a point which had been enforced very strongly by Rogers. It would be remembered that he laid very great stress on that point, that first of all the arches must be so altered that the child could bite in the correct position, and when he could do so he must bring his teeth into the right position, contracting his muscles many times forcibly, so as to make the position permanent. The speaker thought that in that way the procedure was likely to be far more effective than simply to use the inclined plane. He had used inclined planes many years ago, but he gave them up for reciprocal traction, and for this reason, that although he could alter the child's bite, he found that the child tended to resume the old position. The child could bite in either position. By using reciprocal traction, with exercises, after the arches had been got into such a shape that they could be placed together correctly, he found it much easier to obtain the result where the child could not by any means get into the old and wrong position. As to what took place in the joint or did not take place, none of them really knew, but in some cases—particularly those which he had treated some years ago—he had been fairly convinced that after a while there was no difference in the relation of the mandible to the maxilla, and the teeth either in one or both jaws adjusted themselves. Of course, one could not prove this. It was only a matter of judging from photographs; there were no exact data available; but in many cases he had felt confident that a change had taken place in the joint. If one allowed that a change could take place in the joint, it was much better to get the mandible into position and keep it there than to let it go backward or forward all day. That was why it seemed simpler to him to use reciprocal traction instead of the inclined plane, providing always that one let the child do muscular exercises to keep it there.

Mr. George Northcroft wished to ask what terminology Sir Norman would use to describe a "general crowding." "Lack of bony development" was rather a mouthful to express what was meant, and he would be very grateful to learn of some substitute. He was at the moment wishing to describe a group of cases which he had called "general crowding," and at present there seemed to be nothing better to replace it. With reference to the biting plate versus intermaxillary traction, the whole point lay in whether the mandibular incisors were sufficiently depressed to bring the mandible satisfactorily forward under intermaxillary traction, and whether the force of the mandibular incisors striking against the maxillary in-

cisors in intermaxillary traction was sufficient to depress them. In those cases where it was not undoubtedly sufficient to depress them, he thought the inclined plane was good practice, but one should have enough knowledge of both technics to use either method where it was obviously required. He always tried to be catholic in his choice of method, and to choose the method which he thought right for the particular case in hand. He thought that Sir Norman's description of the group of conditions which had to be taken into consideration when first looking at a case was very useful and valuable. It would be a very good thing if that sentence from his paper were typed out and placed on every desk and looked over when the operator was called in to a consultation over a new case. It showed what a number of things one had to think about. Some of them were very likely to be forgotten in their enthusiasm or predilection for particular theories. They reminded one of the many pitfalls which had to be encountered. It was well to ask the parents whether there was likely to be any difficulty with the school authorities in allowing the necessary number of visits to continue the orthodontic treatment. Often treatment was complicated by reason of the fact that such inquiries had not been made beforehand. Sir Norman's paper was so straightforward that it left very little to discuss, but it was none the less valuable on that account.

Mr. Harold Chapman congratulated Sir Norman on having thought of a subject which was not included in either of the two new editions of dental textbooks which had appeared during the past six months. In the index of neither of them was the word "psychology" to be found. Sir Norman had so well covered the subject of psychology that there seemed little to be said. He had put forward three aspects of this, namely, the patient, the parent and the practitioner. One point which perhaps had not been mentioned was that when the actual orthodontic operation was going on, the patient must be the center of attention the entire time. The attention of the operator must not be allowed to wander to the parents or anybody else in the room. If, on occasions, he had allowed his attention to lapse a little he was, metaphorically speaking, hauled over the coals, and it really was a very important point that the child should be in the center of the picture. That was very necessary for success; as soon as one relaxed one's concentration on the child, the child reacted to it immediately. Sir Norman had not referred particularly in his paper to Divisions 1 or 2 of Class II, but it was made clear by the lantern slides which he had shown at the end that he had referred to Division 1. He himself had not been so successful with removable appliances, but perhaps that was due to his lack of appreciation of the situation and of what the patient would do for himself. It had only confirmed what several mothers had told him from time to time, that they themselves were postnormal at twelve or fourteen years of age, but when they grew to be adults they had trained themselves to bite in the forward position. The cases which Sir Norman had shown confirmed the view that that was a possibility. Referring to the orthopedic principles of treatment which had been mentioned, one of the principles which the orthopedists demanded was that the improved position should be maintained all the time, and that was what he felt that Sir Norman could not obtain if plates were used; though, if intermaxillary traction were used, it could be maintained uninterruptedly. He did not quite agree with Sir Norman when he said that the volition of the patient played no part; he thought that with the use of intermaxillary force volition did play some part. He could recall the case of an apathetic patient, where intermaxillary force did considerably less good than in most cases. He told his child patients that the rubber bands were reminders to them to keep the jaw forward. They were not to let the rubber bands do all the work. In support of the argument that continuity of use was essential, he could recall a child who was wearing intermaxillary elastics for two years, and the result at the end of that time was not what he expected. He knew that in the type of case of which this was an example and the intermaxillary force was worn continuously, that at the end of twelve months there would be practically a perfect or normal occlusion, but in this case at the end of two years the results did not materialize, though in reply to inquiries he was told that the rubber bands were worn *always*. At last he discovered from the nurse that the patient never wore the elastics at night. Of course, he made indignant remonstrance, and now the rubber bands were worn all the time. But the case did seem to emphasize the fact that maintenance of the improved or new position must be continuous. As one interested in the teaching of orthodontics, he desired to say a

word about the specialist and the general practitioner. He thought there was a place for both, and that it was important that the general practitioners should have a good knowledge of orthodontics and be able to practice it. Probably the lack of interest in this subject was partly explained by the fact that in the examinations it had been allowed to take a very minor position. That was a serious matter, and it was interesting to find that in some of the newer universities which were granting degrees orthodontics played a larger part in the curriculum. The students' interest in orthodontics should be encouraged, and lectures should be compulsory. Technical work should be compulsory also, and in the examination there should be a special paper on the subject. Whether afterward the practitioner actually treated patients could be left to his own discretion. If he was interested in the subject he would treat them; if he was not interested, at least he would have been taught the technic and the principles of practice, and he would then be in a position to advise parents on the proper course they should adopt, whereas at the present time very frequently the general practitioner was not able to advise to the best advantage. That was a matter which was well worthy of the consideration of the examining authorities.

A member said that he had listened with particular interest to the so-called operation of raising the bite. Sir Norman had said that after inserting a biting plate the results varied considerably, sometimes improving almost at once and at other times waiting for a long period before improvement was shown. He wished to know whether this did not depend upon the period at which the plate was inserted, whether preceding or immediately following an eruptive process in some other part of the mouth. Was it not better sometimes to delay putting in the biting plate until the eruptive process was again active, or, if the plate was necessary as a splint to keep back the first permanent molars, would it not be better to add material in front of the plate until the premolars had commenced to erupt?

Mr. H. E. Marsh said that on the all-important question of enlisting the cooperation of the difficult child and the parent, he had found it of the greatest assistance to make use of a collection of ready-made appliances, with the aid of which he could explain to the child exactly what he intended to do, and he made use of these ready-made appliances mounted on models at every stage in the construction of the appliance for the child's mouth. He had not only found this a very great aid in getting over the fear of the child, because he could explain exactly to the child the various stages of the construction, but he had found it also a very great help in enabling him to make and fit appliances much more accurately than he could before. He thought members would agree that badly constructed appliances were a very frequent cause of want of success. They all had experienced the anchor bands which came off when the child was away, and these, in the case of a fixed appliance, led to a great deal of difficulty and probably suffering on the child's part. If one came upon a molar with a badly made amalgam filling in it, for which it was necessary to fit an anchor band, and if one had to trim the filling, the process might be painful, necessitating the use of a local anesthetic, which was troublesome in the case of a nervous child. If one could show the child, with the aid of a band and tooth on a model, exactly what was to be done to enable the band to be fitted properly, it would be a means of gaining his confidence and assisting not a little toward a satisfactory result. In the case of biting plates, too, he had found it of great assistance to have a biting plate made, finished and mounted on an articulator, so that he could explain to the child that the aim was to permit the molars and premolars to erupt further, after the mandibular incisors had been propped open.

Dr. E. S. Friel said that he wondered, when he got the notice of the title of the paper, whether Sir Norman was going to make a tirade against orthodontists for wrecking children's nerves during treatment. One principle of psychology which he had himself applied, and which he thought of great importance, was always to be honest with the child and never to tell a deliberate untruth. The importance of that had been brought home to him the previous week, when a lady brought a child to him for the first time. When they came into the room the mother said, "I want you to look at this child's mouth," whereupon the child made a frightful scene and said, "But you told me you were only coming with a message to Mr. Friel." It took him a quarter of an hour to make that child quiet, after which she gave no further trouble. It was the deliberate untruth which had upset the situation. With regard to the

treatment of postnormal occlusion, there was a certain amount to be said for the treatment which Sir Norman advised. Exercise should have a great deal to do with moving the jaw forward. Only a few days previously he had been speaking with Dr. De Coster of Brussels, who told him he never used intermaxillary traction for postnormal occlusion, but only muscle exercises or possibly a bite plate. Personally he used intermaxillary traction, but he employed very weak elastics. The pressure of the elastics he did not think ever exceeded one and a half ounces each side, and they served as a reminder to the child to bring the jaw forward. Sir Norman had mentioned that he could not understand how teeth could move forward through the bone, and he had said it must be a movement in the joint. But Professor Brash's work, he thought, indicated that teeth could move through the bone, and he thought it was possible that the stimulus of a weak elastic was sufficient to make the teeth want to move forward in that way. Certainly in the treatment of some of these cases, the close-bite seemed to disappear as if the teeth actually were moving, and this might be due to a combination of changes in the condyle as well as actual movement of the teeth through the bone.

Mrs. Muriel Michaelis said that it was most important to enlist the help of the child. With the removable plates particularly, she had found that when one instructed the parent or nurse to keep the plate clean, one did not get anything like the success which one did if one made the child understand the importance of keeping the plate clean and undertake to do it for himself. Very often the parent or nurse forgot to do this, but the child himself, if he could really be made to cooperate, would not forget. As one small child said to her, "Mother is no good at cleaning the plate, she leaves the corners out." She was very particular about not having any parents in the surgery, even though such practice was a little unpopular. The only time she did waive her rule was in the case of a very small child of four years who was supposed to be extremely nervous, and both the father and mother came and insisted on stopping in the surgery. Nothing, however, was done during three visits until the parents were—she feared with some rudeness—told to wait in the waiting room, after which there was no trouble at all. If the orthodontist got the children by themselves, their interest could be better obtained. If their parents were present the child would keep looking round to see whether the parents were attending. She always let the children have a book, and then, during the time occupied in soldering and other things, the child did not get fidgety. In that way, during the intervals, the child was not occupied by wondering what was the next thing one was going to do to him, and whether or not it would hurt.

Mr. H. G. Watkin said that he was glad that Sir Norman was numbered among the extractionists, and was not afraid to suggest extraction where he thought it would be an advantage. With regard to the inclined plane, it had been his practice, when giving a biting plate, to supplement the power of mastication by means of exercises. As Mr. Badcock had said, in the ordinary way action only took place during mastication if one had no exercises; but if there were exercises, a quicker result was obtained. With regard to Dr. Friel and the patient who cried, he had had a similar experience. The mother had brought two children into the surgery, and when she asked that the second one might be examined, the child immediately protested and said, "You didn't say I was going to be looked at." But he himself in that case refused to do anything, because he would not let the child think that he was doing something behind his back.

Mr. Bull said that some speakers had placed the responsibility for orthodontic treatment on to the child. He knew that youth was very much to the fore in these days, but after all it was the parent who paid the bill, and the parent who would protest if anything went wrong. Therefore, although the child should be taken into account, he did not think that the whole of the responsibility regarding treatment should be placed upon the child and the parent left in total ignorance.

Mr. Pitts said that he would like to recount one little incident which illustrated the importance of getting the cooperation both of the parent and of the child, without which all orthodontic cases were foredoomed to failure. Some years ago a child of eight or nine years of age was brought to him—the only daughter of rather elderly parents. She had a mesiocclusion, and he decided to put a fixed appliance on the maxilla. This was done without difficulty. A

couple of days later the family doctor telephoned him and said that the child was not well and that the mother was "fussing herself to death." The family doctor knew quite well that there would be no peace until the thing was taken off. He saw the people again, and found the mother full of woe; the child, she said, was unable to eat or sleep. On looking into the mouth, he found that the tongue was heavily furred, the breath offensive, and there was a history of constipation of some standing. But it was obviously a case in which argument was no good, and so he removed the appliance, receiving next day a jubilant letter from the mother in the tone of "I told you so," informing him that the child was now perfectly well.

Sir Norman Bennett said that Mr. Badcock had agreed with him that the biting plate operated chiefly or entirely during mastication, and that it was necessary to separate the molar teeth by only a very small amount indeed. Mr. Badcock thought the same thing happened with regard to an inclined plane, and therefore unless one made the inclined plane such as to correct the malposition in one jump, and put the teeth into normal occlusion, the child could not bite; so that the inclined plane would not do any good. Sir Norman did not think that that point was very difficult to answer. He did not believe that an inclined plane acted only during mastication. It was true that the normal position of rest was with the teeth slightly separated, but a person—adult or child—did not go about all day in that position. He was constantly shutting his teeth every time he swallowed saliva, and at all sorts of times, and if one could induce in the child's mind the idea that he had to bite forward, he would do it at all sorts of odd times, quite apart from mastication. He believed that the reason for raising the bite ever so little was that nature worked things gradually. If one separated the molars by a large space the molars themselves would, as it were, make no attempt to come together; whereas if they were separated by only a slight distance, then, in mastication, they did tend to come together. There was another point about trying to bring the jaw forward all in one leap. He believed that the condyle grew backward. They knew that it was growing backward in the normal process of growth. All they wanted to do was to accelerate that process a little. There again, if one made the condyle only come forward a little from its position of rest, it was more likely to keep on growing backward a little more quickly than normally. Another point was that it was possible at any rate to do the work in two jumps, because, in some cases at least, if one came halfway, one had the position of malocclusion of half a unit, which did give some masticating possibilities.

As to whether the jaw came forward or the teeth came forward, personally he could not believe that the teeth came forward in the jaw. He would admit on anatomic or physiologic grounds, that growth of bone might carry the teeth in various directions, forward as well as upward, but if the teeth came forward the result must be a labial inclination of the mandibular canines. If the teeth were all in contact and the molars and premolars were to be considered to have come forward in the jaw, that could only be done either by the canines coming forward as well or else by sloping forward, and he had never noticed that the canines sloped forward after treatment of these cases any more than they had done before. Therefore he did not see how the teeth could have come forward in the jaw.

Mr. Northcroft had asked him to invent a name for general crowding. He had never succeeded in doing so yet. A name could easily enough be invented which would indicate underdevelopment of bone, but it had to carry with it the correlative idea of the irregular position of the teeth.

With regard to the question of the inclined plane versus intermaxillary traction, he entirely agreed with those members who had said that each case must be treated on its merits. Undoubtedly there were some cases that came forward more easily than others, and he agreed that the intermaxillary elastics should not be regarded entirely as passive methods of treatment. If the psychologic method was taken into account, it might be regarded as a sort of reminder or stimulus to the child to bring the mandible forward of his own accord.

Mr. Chapman had asked whether he had objected to the child swallowing half the plate or half swallowing the plate. The case he had in mind was one in which he had sent a child to school with an expansion plate. The local dentist thought, quite rightly, that sufficient

had happened, and so he made a retention plate which consisted of a small vulcanite appliance. Afterward the father brought the child to him, and exhibiting the plate, said that he did not like it at all because the child had half swallowed it, and it had entailed a very disagreeable process to get it back again. That had confirmed him in his belief that no plate should be inserted in a child's mouth which was capable of being swallowed or of getting into a dangerous position at the back of the pharynx.

When he was talking of Class II cases he was really thinking of Division 1.

He had been interested to hear about adult patients who said that they had at a comparatively late age cured themselves. Some while ago he saw a child of three years with a prenatal mandibular occlusion, which he was expecting to treat, but a little later on the mother said that the child's condition had rectified itself, and, sure enough, instead of the prenatal mandibular occlusion, the child had got a normal occlusion. The previous condition had evidently been due to habit, and the habit had been broken.

With regard to the question of raising the bite at the time when new teeth were erupting, he thought it was a great help if teeth were erupting, because the erupting teeth would go on more easily than those which were or had been in occlusion. He would much prefer, however, to do the work at an earlier age—in fact as soon as possible—because he would have every expectation of being able to cure the condition.

Dr. Friel had emphasized the great importance of being perfectly honest and straightforward with the child, and with that he agreed. He had been interested to hear the opinion of Dr. Da Costa. He felt that many of them could use muscle exercises a great deal more than they did.

Mr. Watkin had said that he (Sir Norman) had joined the extractionists, but, in fact, he had always been one of them. He had never been able to convince himself, in the cases one saw at hospital, where obviously the jaw was so small that it could not possibly hold the normal complement of teeth, that some extraction was not called for.

He agreed with Mr. Bull that, after all, the parent did come in somewhere. The parent must be allowed to have some little share in the results which one was trying to obtain, and it was desirable to explain to the parent exactly what one was doing, and the reason why one was doing it. It was by the cooperation of parents and children both, that one got the best results.

Mr. Pitts had reminded him that the second case which he had shown that evening was a boy who at an earlier age had had fixed appliances. This boy was entirely miserable with these appliances until they were taken off. Later he had learned that, with the appliances that he himself had provided, the boy was setting himself to wear the plate for so many hours the first day, and so many hours in subsequent days, and the knowledge that he could take it out enabled him to endure the discomfort. That was an interesting example of the varying attitudes of mind that were shown by different kinds of children in respect to different kinds of appliances, and bore out the necessity for choosing the one most suitable for the case in hand.

DEPARTMENT OF DENTISTRY FOR CHILDREN

REPORT OF THE PREVENTIVE DENTISTRY SECTION OF THE BETTER DENTISTRY MEETING

THE Greater New York December Meeting with its slogan "For Better Dentistry" was the center of attraction for the eastern dental profession from December fourth through the eighth.

Despite the depleted pocketbooks of the dental profession this year, and the close proximity of the meeting to the annual visit of Santa Claus, the attendance set a new record. Especially was this increase in attendance noticeable in the sections dealing with prevention, mouth health, and dentistry for children, which will be covered in this report.

Outstanding in the field of preventive dentistry among the registered clinics was the two-hour continuous clinic of the Hyatt Study Club. This group of sincere and enthusiastic workers comprised of some of the best-known dentists in the metropolitan area always puts on an excellent performance; but this year under the inspiration of their leader, Dr. Hyatt, they rose to even greater heights. Their clinic played to capacity audiences every morning, and fifteen minutes after starting time usually there was standing room only. The clinicians were: Doctors B. Clug, W. B. Dunning, H. S. Dwyer, Alfred Walker, and Will Frazer. The subject of the clinic covered the treatment of pits and fissures. . . . "A study of histologic and microscopic formation of pit and fissure cavities. Demonstration of immunizing, cavity preparation and filling of these cavities with plastics, amalgam, cement, tin and gold foil." Each one of these phases was demonstrated by a different clinician, the whole consisting of a two-hour postgraduate course in prophylactic odontotomy.

Dr. E. Melville Quimby of Boston gave an excellent clinic on "Tomorrow in Dentistry" in which he showed the necessity of changing the mental attitude of the members of the profession from that of the skillful operator alone, to the more profound study of the *health* of the patient as seen through the mouth. This was very carefully presented, clearly and profusely illustrated both by slides and by charts. Dr. Quimby's work is the result of years of study, and his excellent analogy between the closely related functioning of the parts of the body with the synchronous movements of a complicated machine brings out very forcibly his message of correlation of parts and constant care.

Of primary importance to those of us interested in prevention was the lecture by Dr. Russell W. Bunting on the "Present Status of Our Knowledge of Dental Caries." The speaker covered the various lines of research which have been carried on in the past and gave the results of the work of the Michigan

group. He pointed out the close relationship between intake of carbohydrates—especially refined sugar—with increase of *B. acidophilus* and consequent rise in the incidence of caries. He stressed the fact that caries occurs only when and where the *B. acidophilus* is present, and that corrective diet does *not* prevent caries by an action from within the tooth, but rather through a change in the flora of the mouth reducing the probability of the tooth's being attacked from without, by reducing the *B. acidophilus* to a minimum. This he gave as the probable reason for such widely different diets as are advocated by our leading dietary authorities all showing an improvement in dental conditions because all were basically good diets with a very low sugar content.

Again Dr. Bunting appeared before the meeting—this time as the leader in a very interesting discussion on dentistry for children. So great was the interest in this discussion that besides those seated around the speaker there were more than seventy-five standing around the group, unable to secure seats. In this talk he again stressed the importance of low sugar intake and the immediate operative care of all pits and fissures.

An incident of decided dramatic interest, and consequently widely misquoted in the press, occurred during the reading by Dr. T. P. Hyatt of his paper, "Are Operative Preventive Measures Practical?" Dr. Hyatt challenged any one to debate with him before a competent jury the well-known slogan, "A Clean Tooth Will Not Decay," Dr. Hyatt to take the affirmative. The challenge came as the climax to an interesting discussion of the practical merits of operative preventive measures which, while it gave due recognition to the value of a good diet, stressed the fact that developmental defects (pits and fissures) constitute a constant liability which diet alone does not eliminate.

Certainly the indications would seem to show a healthy stimulation of interest of the general dental practitioners in mouth health, prevention, and dentistry for children.

H. S. D.

WHY DENTAL HEALTH EDUCATION IN PUBLIC SCHOOLS*

C. CARROLL SMITH, D.D.S., PEORIA, ILL.

Supervisor of Dental Department, Peoria Public Schools

GREEK mythology has handed down a legend about the god Prometheus who they say brought fire, artificial light, down from heaven, and that all the gods were angry with him for giving to man their very best treasure. So man had the kindled fire, the torch, the little bronze oil lamps and then the candle.

Human intelligence, with its innate developmental tendencies, said, "Here is a candle. Can we increase the light? Can we produce a light equal to two candles? Can we arrange to have one light that will do the work of twenty candles? What are the possibilities of artificial lighting?"

That was a great question. It is always a great question when man says of anything, "Can this be made more?" The process of lighting the world's darkness had begun. Here and there, all along the way of time, men of genius contributed their bit toward the development of this great gift which was to become a universal benefit to all men. Then came our own Edison who made it possible to banish instantly the deepest darkness by a contact with the infinite which results in a mere touch of a button and the whole world is aflame with light. Modestly, quietly, but with telling devotion, his pioneering, his discovery and development of an idea have left all the world full of light.

I saw this statement recently, "Disuse is abuse and abuse is injury and the more delicate the thing injured, the sooner its vitality ceases and it loses its power." The discovery, development and protection of possibilities are essentials of progress. He who is not alert to the inspiration of new ideas and their unfoldment is not in accord with the onward march of civilization and the laws of advancement which naturally govern the growth so necessary to society and good citizenship.

In the midst of the progressive forces of the times, a boon to mankind steps into the limelight and offers its benefits for the good of the race. It comes as a solution for many a human problem that has never yet been solved. This gift of beneficence stands ready to serve in answer to a question that is being asked in every community, "Shall dental health have a place in the curriculum of the public school system?"

Here inspiration and a call to service combine to offer a possibility for increased activity which means illumination to the health, culture, usefulness and happiness of the girls and boys in training in our public schools.

"Why dental health education in public schools?" Because of its need in the life of the child. Because of its place and province as an educational factor. Because of its function as to dental inspection, dental service and the oppor-

*Delivered before Seventy-Fifth Anniversary of St. Louis Dental Society.

tunity it presents as an aid to pedagogics. Because of the practical benefits to be received for the physical, mental and cultural welfare of the pupil.

The school is distinctly an educational institution. Everything connected with it must serve to an educational end. Benefits must be administered for the good of the pupils whose lives are being molded for present and future comfort, usefulness and happiness. An enlightened citizenship is in the making. Here girls and boys are being prepared to assume the tasks of a progressive civilization. They are to become the men and women who must measure up to the highest and best in thought and action. In order that increasing opportunities may be discovered and developed, that latent possibilities may be actuated to meet the unlimited and irresistible advancing needs of the human race, dental health presents benefits that are necessary to physical and mental culture.

The idea of dental health is with us as a factor of mental, physical and disciplinary illumination for the good of the growing girls and boys in our midst. Where shall the workshop be located to develop it? In the same educational factory that is molding the mental processes of childhood.

The dental profession is in possession of knowledge that the child of school age needs as a part of mental and physical preparation for life. These benefits of dental health cannot be presented technically in the classroom. The public school has modern methods of training which are peculiarly fitted to impress the child mind. How are the dental profession and the educational profession to combine in a comprehensive program that will serve the child through an educational process and measure up to modern methods in pedagogics? Dental health must be recognized as an essential to a well-rounded preparation for usefulness and as a refining characteristic in the process of perfecting the whole man. In order that this important subject may become a part of the child's common school education, it must be made to conform to and correlate with other curricular activities.

In this day of enlightenment it seems hardly necessary to present to an intelligent group, made up of men and women from our public schools and from the dental profession, an argument to convince them that the community needs service along lines offered through a dental health program.

Every dentist whose motive is honest, whose purpose is sincere, whose endeavor is along lines of progress, whose heart is in his work and who is practicing his profession for the good he can bring to his fellow man, knows that the public needs educating concerning the importance of a clean mouth and the value of a perfect set of teeth.

Every child has a right to clean, wholesome mouth conditions, to a well-kept set of teeth and to a knowledge of their relation to the general welfare of the entire physique. Dental information can be better disseminated through the child and be more sure of accomplishing results than multiple effort with the adult, whose prejudices are biased and whose habits are fixed. The child is a bundle of receptivity and is best fitted to take on new views, see right values, respond to progress through information and fix new habits that will insure a better race.

It is not enough to know that we live in a wonderful age, ripe for a healthful, happy and useful state of being. It is ours to recognize the advantages at

hand, respond to the opportunities knocking at our door and do our part to help the child to know his privileges so that he may appropriate measures now at his command, to make the doorway to the body a fit and safe vestibule to guard, receive, prepare and pass on the food needed to help sustain a normal physical constitution.

Community dental education is not a luxury but a necessity—a prerequisite to good scholarship and good citizenship. Two questions clamor to be heard and insist on intelligent replies. First, the community asks, "What may we rightly expect of you, the dental profession, in the way of information to bring us in touch with benefits, of which you have knowledge, to produce a better citizenship?" Second, the dental profession asks, "What can we do to instruct you, the community, that you may recognize and take advantage of the means available through dental knowledge to help you to a more intelligent and useful citizenship?"

That our communities are dentally uninformed and consequently suffering is not to be wondered at. Consider the lack of organized effort in a standardized program whereby this ignorance may be lifted and the light of tooth intelligence brought to the community. We are in the midst of a pioneering opportunity to develop a system of education by which instruction as to perfect mouth conditions in a normal body may be the heritage of every child and that citizenship may be advanced through a more comfortable and healthful existence.

Our nation is made up of states. Our states are made up of communities. These communities may be counties, cities, towns, villages or rural districts. Each county or city is a compound or complex community, for it is made up of communities within communities. These communities are composed of individuals, and it is impossible for any individual to get outside the pale of a community. There is no place anywhere where a community is not. Mankind lives together. No man liveth unto himself alone. Whether we like it or not, we live our lives with relation to every one in our community. We receive from and give to every one about us.

What are we, the dental profession, giving to our community to enhance its citizenship? We have a responsibility. It is not a new responsibility; it has always been our responsibility. Why have we been shirking it? Have we any excuse? Is it because we are lacking in backbone? As a dental profession we have a strong backbone, for we believe in our line of endeavor for the good of mankind. We know that we have a legitimate way of doing good and we are proud of the possibilities of our profession.

Then what is our excuse? We have not known how to go about it—this matter of dental health education for the community. We have had no vision, or if we have had vision, it has been hazy and indistinct. If some measure of vision has come to us, we have not analyzed it sufficiently. We have not come together as a profession and definitely diagnosed the community situation, systematically planned to relieve it, organized to solve its problems and take care of its needs. Dreams have haunted us for years but have given us nothing tangible on which to build a program of community endeavor in dental health

education. We have been looking for light, but each daydream has led us to confusion and indecision, and forebodings of impossibility have ended in discouragement.

Is there no way then? Must the community go unserved? There is a way and the community can be served. When? When we will. "Where there's a will, there's a way," is a maxim not too old for the dental profession to apply to this present-day problem. Every community has big men with big hearts in its dental personnel. They have accomplished big things in dentistry. They have solved big problems and they are still solving them. They are big enough to solve their community dental problem and they will solve it.

This dream of dental health education in public schools is a large undertaking. A real job and a worthy one awaits the touch of patient and persistent endeavor. A great opportunity to do a great amount of good is calling for action. It is a necessity and it is a possibility. Every community has a right to this service. It is a joint responsibility of the dental profession and of the community. The community and the dental profession should cooperate.

The only way to further this community dental service is through the public school system, working pleasantly to break down prejudice and to secure cooperation so that dental health information may become the child's privilege. It is in the child of school age that the hope of this community educational opportunity lies. The members of the dental profession will find their greatest sphere of usefulness when they make the child and preventive dental measures their basis of endeavor.

Each public school system stands for a definite community spirit and need. A dentist who conscientiously plans a program for one community can adapt it to any community large or small, city, town, or rural district. The subject matter may be the same but adaptation is the secret of success.

The installing of a dental health department in a public school system calls for careful consideration of many things. Such a department must coordinate with other departments and must correspond in method and routine with pedagogical processes so well adapted to the child psychology of today.

The activities of the department must be carried on in cooperation with the administrative regime in order that accomplishment may be brought to pass without unnecessary difficulty or friction. Conservation of the teacher's time and effort, as well as that of the pupil, must have our thought and attention in order that the program may be adjusted to a unity of purpose and endeavor with methods and conditions as we find them. There will be no question about the success of the department when the work is carried on in harmony with the school organization. Concord, not interference, must characterize the activity. There are the impressions to be made and habits to be inculcated through a dissemination of information on dental health. This can be done so as not to interfere with the work of the teacher or pupil, but rather so to correlate with other subjects in the curriculum as to be of real value as supplementary service that will be a help and pleasure to all concerned.

The school needs the dentist and the dentist needs the school. But the dentist is not usually trained in teaching processes and the public school teacher

is not trained dentally. Then it must be some one's particular problem in a community to administer the office of dental health, to study the need of that community with special reference to the teaching advantages offered through the local educational system. Teachers for teaching and dentists for dental health should make an ideal combination.

If the dental profession solicits the help of the teacher, then the dental profession must provide some one who will devote his time and energy to measure up in some degree to the teacher's standards of excellence, by producing subject matter that is practical and usable. This subject matter must not be routine or stereotyped. It must be kept out of the ruts. Variation and initiative are needed to keep the material ever new and in progress with new teaching ideas and methods. The dentist who makes this his task must enter upon it with an inquiring mind, determined to study and solve problems and harmonize situations.

When the dental health program was inaugurated in the Peoria community in 1909, it was not very welcome. There were few who knew enough about the benefits in store to realize its importance. Through patient and persistent endeavor, the movement gained in favor, and it was not long before there was quite a nucleus formed among dentists, instructors and citizens who saw the light of promise. The work grew. For a number of years there was much groping in the dark. The story of struggle and courage amidst discouragement and opposition is a matter of history. Too much cannot be said for the noble hearts who never gave up but always insisted, persisted and encouraged until finally it was acknowledged that a foundation had been laid and a dental department established in the public schools.

But establishment under recognition and support from the Board of Education was not the end of the story. At this point the stepping-stones of educational activities were just being laid. It has taken years to build the road over which travel is now definitely established. That Peoria has a dental department operating harmoniously and efficiently in the public school system is a matter of pride to our entire community. The good that has resulted and the benefits that have been received cannot be reckoned in terms of money, but are measurable only in educational values. It must be recognized that the children in our schools are better in many ways because of the dental department. By the improvement in their health and their increased mental ability, they are less expense to their parents and of greater value to their community.

Through the process of developing this dental health program, the administrative forces in our schools have been magnanimous. Superintendent, supervisors, principals, and teachers have given their efficient and constructive cooperation. The Board of Education has stood by with a wealth of good cheer and a degree of confidence that has upheld the morale of the department.

It has been my privilege to serve for fifteen years as supervisor in the dental department of the Peoria public schools. During this time the confidence and support of the Peoria District Dental Society has helped to tide over many a difficult situation. This Society's Committee on Oral Hygiene has efficiently and unselfishly acted in an advisory capacity, always standing by in time of need as protection and encouragement, but it is the superintendent of schools,

the supervisors, principals and teachers who have been our mainstay and support. It is through their counsel and constructive criticism that we have arrived at our present state of progress. Too much cannot be said in appreciation of the comradeship of our teaching force.

When I took up the work fifteen years ago, I knew very little about subject matter, methods and projects. With a mind to progress, a spirit to study the problem, a heart to serve, a desire to fellowship, a will to conquer and a love for the child, the task was begun. Through the years, how patient the teachers have been. Their cheerful cooperation at all times, their timely suggestions and their pedagogical skill have been the factors that have helped most to develop our present program. It was through them that we have arrived at some degree of efficiency in anticipating what will be acceptable in the way of material and the manner of presenting it in project form.

Two projects are given each year to each grade. They are of such a nature as to allow the teacher ample time for production without interference with regular studies. The pupils are always eager for these projects. They afford pleasant occupation, carry definite instruction which tends to habit formation and act as a spur to endeavor.

"Why dental health in public schools?" The answer is to be found in the child's increased capacity to express health, happiness and usefulness through mental and physical improvement.

CHILDREN'S DENTISTRY AN IMPORTANT FACTOR IN DENTAL ECONOMICS*

HARRY B. SHAFER, D.D.S., ANNA, ILL.

IF THERE is a man today who firmly believes that deciduous teeth cannot be successfully filled, he is entitled to his opinion; but I ask him in all sincerity kindly to refrain from broadcasting it, because I feel that he will be forced to change his position.

"Darn the kid business," is expressive of the attitude of too many members of our profession, and one thoughtless remark often discounts hours and hours of constructive suggestions.

Over sixty thousand dentists are striving to control pyorrhea, focal infection, and abnormalities, and we are like some football teams, making a strenuous effort in the final quarter, when we should have been fighting hard earlier in the game.

Almost daily our patients lament the fact that fear and dental pain during childhood had caused them to avoid the dentist and they became dental cripples for life.

I care not what branch of dentistry you are pursuing, the mental attitude of your patients toward operative procedures is influenced by what transpired at the first dental appointment. Fatigue which dentists are conscious of at the close of a busy day can be minimized if more attention is given to first impressions.

Our older patients die, move to other cities, and forsake us, and it is said that if we fail to replace them our declining years may be spent in idleness. Most wise is the man who has the ability to look in the future and attract as his patients, several hundred three-year-old children. Why not brighten the day's work with four or five appointments with youth? It is a joy to do preventive work, and a child once your friend may be your patient for years.

I shall never forget one mother who thrust her child into my operating room at an unfortunate moment, just before closing time and this is what she said: "Extract his tooth, Doctor, if you can, his eye has been swollen shut for two days. I doubt if you can do anything for him; whip him if you have to," and she left the office. Is it not a fact that any procedure we may decide upon in a case like this will be stamped indelibly on this little patient's mind and all through life he will be unable to forget it? Therefore I am inclined to think that the most important phase of children's dentistry is "the reception, treatment, and dismissal of a four-year-old child."

I say four-year-old fully realizing that they should come to us at the ages of two and one-half or three years, but due to the fact that the average mother is one year behind with the first appointment we usually see them at the age of four.

*Reprinted from the February 11, 1932, issue of the Chicago Dental Society Bulletin.

This is not the only method of handling children, but it is a method which I have used quite successfully during the past few years.

1. In all undertakings success depends somewhat on a good start. It is desirable that the first appointment be made at an hour when the dentist is at his best. An early start assures a prompt arrival, the child avoids rush and hurry and if properly prepared mentally and physically and informed by the mother as to the nature of the visit he will be calm and perhaps eager for the experience.

2. Upon his arrival the thoughtful dentist will see to it that little eyes and ears will see and hear only the things which will inspire confidence. A small costumer for his coat, a little house, or a mechanical toy and the first reaction will be admiration and joy.

3. When a mother and child meet another adult the conversation is often over the child's head, and little effort is made to discuss subjects of interest to



Fig. 1.—A special "Junior" room is the best possible evidence of the dentist's special consideration for children. It inspires a feeling of friendliness and confidence in the child patient, impresses the parent, and helps build a lasting patronage.

him. Not so in the dental reception room, the lady assistant greeting the child devotes 98 per cent of her attention to the patient, giving him every consideration and directing his attention to a toy suitable for his age. One moment of play will make him feel important and at home, and all other matters are lost sight of for the moment.

4. Meeting the patient at the door of the operating room is an important step. Smile, approach him slowly, treat him as you would the governor of your state, call him by his first name and remark, "So you have come to show me your teeth." Should he hesitate to walk in he is reassured by the mother and by the assistant and placed in the chair and the towel adjusted. In every direction he may chance to look, something pleasing should catch his eye, and fear will give way to pleasure.

5. During the half hour in which we work for the child the mother is seated nearby so that he may see her. She is requested to read a magazine and pay no attention to what transpires. Seeing the mother calmly reading and with no anxiety on her countenance he will relax and think all is well. The assistant smilingly assumes her position and after a moment's pleasant conversation we proceed with the first prophylaxis. Use lip lubricant freely, slow movements, hand instruments at first gradually working up to the engine. Frequent rests and little praise are necessary, being always mindful of the fact that little mouths are tender.

6. At the conclusion of the sitting comes the reward. We say, "John, pull the elephant," and the light goes out. He is delighted to be of service and after complimenting him on his good behavior we give him a suitable reward and bid him good-bye at the door of the operating room.

7. A chummy moment follows when the assistant takes him into the reception room for more play and this is her opportunity to get into his good graces. Does the mother go into the reception room? Not yet if I can help it.

8. With the door closed and the child in the hands of the assistant, you have the undivided attention of the mother; and now comes what we choose to call the golden opportunity. Show her some models and x-ray pictures of children's teeth and give her the talk of her sweet young life. Ask her if she desires her child's name placed on the list of regular attention. If your psychology is correct, you have made a friend and perhaps two.

9. In many cases the departure is a reluctant one, and the child actually hesitates to leave the congenial atmosphere of the office, and some days later when he calls to you from across the street, "Hello, Doctor, I like dentists," I hope that you will chest out and feel repaid for your patience and efforts and can truly say, "I like kiddies."

I slumbered peacefully for nineteen years, sadly neglecting my duty toward children. Only three years after the awakening I have increased my work in this field four times, and I do feel that "Children's Dentistry" is an important factor in dental economics.

I should like to direct your attention to some facts which should seriously affect your future as a professional man. There are forty-five million children in the United States who if divided by the number of dentists make each one's share seven hundred and fifty. Now I am sure that seven hundred and fifty children cannot be moulded into an ideal practice and granting that four hundred and fifty are impossible for many reasons, still I do feel that at least three hundred can be seen regularly, educated in the care of the teeth and wonderful results accomplished.

I have selected a large number of children's records who have had regular attention for thirteen years from the ages of three to sixteen and calculated from the standpoint of very modest fees, it is surprising to note that it comprises a large per cent of one's life work.

One hundred and nine dollars was the average expenditure for all professional services for thirteen years, with eight dollars and thirty-eight cents as the yearly outlay. Surely very few parents would look with disfavor upon such

an insignificant amount, and from the standpoint of collections it should lighten an important duty and economic burden.

Three hundred patients at a most conservative estimate would help your gross practice thirty-two thousand seven hundred dollars and should you practice twenty-six years, seeing six hundred children at proper intervals, it would reach the surprising amount of sixty-five thousand, four hundred dollars.

Building and maintaining a practice of this kind requires serious thought and there are a few things we must do to be successful. Start tomorrow noticing the children in your neighborhood, get on a speaking basis with them and you will find them as friendly with you as you will allow them to be.

Converse daily with the mothers you see and if you are up on your psychology they will in all probability have the little chap with them at the next appointment and proudly introduce him to you. I believe that a broad smile and conversation which makes the child feel that you approve of him wins many a battle.

Many dentists are sitting in their offices idle, and decrying the condition of their practice, and two blocks away are one thousand children who pass their door twice each day and he cannot see the necessity of school examinations, lectures and educational work.

The irregular child patient coming only for relief of pain is a liability, and parents should be told in no uncertain language that such scenes could be avoided, and that you have an entirely different method which if carried out strictly as advised, will make appointments more pleasant.

The definite suggestions as to the handling of children which I have shown in the slides, approach in my opinion the ideal meeting but I hasten to admit that many contacts with youth are far from ideal. Let us consider briefly a few of the discouraging features which cause many dentists to avoid this work.

First we have large pulps in small teeth, together with a marked interlocking with the cusps of the opposing teeth make permanent fillings a problem. Most young people are restless and there is constant movement of hands and feet and tongue and lips.

At the time we are called upon to fill the deciduous teeth they are under the process of disintegration, and we should be careful to inform the parents that replacements may be expected.

Small mouths require special lubrication, small instruments and mirrors; and a book could be written concerning the control of saliva.

While parents really desire to cooperate, they fail miserably at times and must be excluded from the operating room.

Due to certain influences most children's dentistry is accomplished during the school year, but the vacation period June, July and August is the preferable time. From nine till eleven or two till three are good hours to see children, because after school their vitality is at a very low ebb and the dentist, mother and assistant are certainly not at their best. In our office we prefer thirty-minute appointments and not more than two a week are the rule. It is not advisable to have a child open the mouth wide more than seven to ten seconds without rest.

Why fill deciduous teeth? This is a question we should be prepared to answer in a few brief concise statements on the subjects, *Systemic Infection, Mastication, Irregularities, and Discomfort*.

Conversations in the reception room are dangerous for little ears. Well-meaning adults are apt to talk to our young people about Pain, Grind and Hurt and they must be given more pleasant topics; for instance, "The doctor will count your teeth, make them white, has a funny chair that goes up and down, etc."

It has been my experience that a well-trained dental assistant is a great asset in handling the youngsters, as in this work a number of matters demand your attention at the same moment.

In closing I wish to urge that more attention be paid to what seems to be the question of the hour.

Why children's dentistry? It is our duty to do it unless engaged in another specialty and then we are not relieved of the obligation to talk preventive dentistry. Every time you extract a tooth, when you make a denture do not fail to call attention to the fact that in the tender years an effort should be made to save teeth. Then there is the possibility of increasing your practice one-fourth and that should appeal to dentists during this depression.

I cannot prove the assertion but I feel that children properly treated will remain your patients for twelve or fifteen years instead of the usual six years. Finally, children are enthusiastic in recommending you to their friends, and their sincerity is commendable, and the resulting contacts with adults do you no harm.

THE ADVANCEMENT OF CHILDREN'S DENTISTRY*

STEVE A. GARRETT, D.D.S., ATLANTA, GA.

IN DISCUSSING the management of a dental office one must be very careful or some one will say that the speaker is dealing only with money and with ideas of how to get the most money for the least effort. No matter how altruistic he is, no man can ignore the fact that he must make a living for himself and his dependents.

Many questions of law have for their basis "that a laborer is worthy of his hire." The one who labors in the professions is or should be no exception to this age-old principle.

The history of dentistry contains but little reference to the business side of the practice. It seems to have taken its cue from its noble and wonderful parent, medicine, to give the best service possible with little or no thought as to remuneration, and to accept about what the patient is willing to pay. This practice was probably not so inconsistent in the early days of lesser desires and demands as it is in this complicated time. In this day of keen competition and overcrowded conditions, coupled with the greatly decreased incomes of our patients, we have a new situation. As a result, it behooves each of us to attempt to place our offices on a basis of efficiency that will enable us to make a living. Nor do I contend for the simple eking out of a meager existence but for a reasonably comfortable living with something to spare for that day when production decreases and expenses continue to go up.

There is no one rule that I know of for certain success. Instead, there are many, many rules, and not all of them will fit every case, but some taken entirely, or in part from one plan and fitted together with pieces from others, will work into a fairly acceptable scheme. This will be possible if honesty is in the practitioner's heart, but never if trickery and chicanery are the ruling qualities.

In fact, some one has said that the only requirements to make a success in business are the full knowledge of and the conscientious application of the Golden Rule and the multiplication table. Surely in dentistry this application would be more than helpful—for without them both one cannot succeed.

In either a business or a profession the first thing essential is, of course, to have a patient or customer upon whom to work or to whom to sell, whichever the case may be. In order to sell to the purchaser, whether services or goods are transferred, some acceptable basis of exchange must be arrived at. It may be either the barter and exchange idea or some common acceptable medium. In the not very distant past, money was the article most usually used in settlement for services or goods. As a result we speak in terms of dollars and cents.

*Presented before the Georgia Society for the Promotion of Dentistry for Children, Atlanta, October 23, 1933.

In order to decide how much to charge it is very necessary first to have some method of computing costs. Without figuring costs, we are hopelessly lost, like a ship at sea without a rudder. The inability to know correctly the cost is one of the weakest links, if not the weakest, in the business side of the professions. It should include the cost of professional education, cost of office equipment, salaries, rent, cost of materials, depreciations, cost of replacement, and every expense in the manufacture or construction of a given article, whether it be a filling, regulating appliances, bridgework, plate work, extractions or what not. How else could one know what to charge? In my opinion, it is not sufficient to regulate one's fees by what the neighbor down the hall or a man in another location happens to mention as his schedule of fees. The chances are that he does not know why his fee was a certain figure and probably is not any too accurate in his idea in the first place.

Some prefer to work on an hourly basis. If this can be worked out, no doubt it is the ideal basis for fees. In no event, however, should the patient be acquainted with this hourly figure. He either cannot or does not wish to understand that a charge of several dollars per hour is not unreasonable. Always, however, it is advisable to have a schedule of hourly charge to use as a working basis for your own information. A record of time consumed should always be accurately made and kept. One or two disputes will convince you of the necessity of this record.

In the handling of each individual case a clear-cut understanding as to the final charges had best be had with the head of the family who is to pay the bill. This will tend to prevent misunderstandings, but even this precaution will not always be successful. When a misunderstanding does arise, I think the best policy is to meet the patient on "the customer is always right" basis, but to make every effort to convince him of the correctness of your contentions. Sometimes it may be best to permit him to think he is setting the fee if his attitude is not too unreasonable and if you think that retention of the family among your patients will be profitable and desirable. Each matter like this has to be handled individually, but in making a settlement never lose sight of the fact that you, too, have dependents. Always keep in mind the fact that a professional service can be rendered only by a highly skilled and educated person and that you cannot compete on a fee basis with one who has no investment in life that must pay dividends.

I do not agree with some of the economists who contend that nothing but dentistry should be discussed in our offices. I do agree, however, that much time is unmercifully slaughtered by the manner in which so many proceed. No patient should ever leave the office without some kindly remark to carry home with him, as to how he feels or an inquiry about some other member of the family, etc. In other sections this may not be necessary but in the South we all like it. Many kindly little things may be said while you are washing and drying your hands before you begin work at each appointment. Should the patients attempt to prolong the conversation, it does not seem to aggravate them to proceed with the request, "Open, please."

The cultivation of a keen power of observation pays big dividends. I have yet to find a child who is not well pleased when you comment on his new suit of clothes. At any rate you may be able to get a good deal of valuable information by diverting his mind for a moment.

It is of great importance to be as prompt as possible in all your transactions. I think that it is almost unpardonable not to be at your office ahead of and ready to greet your first patient in the morning. Always do it smiling too—you may not be in good spirits but do not let the patient know it. Listen, if you have to, kindly and sympathetically to your patients' troubles, but keep a stiff upper lip yourself and always cultivate a cheerful attitude. They like to be petted and are willing to pay a little more for it.

I am sure that you have been hearing about the necessity of doing good work and thorough work ever since your first day as a student. That is more necessary now than it has ever been; for, as a whole, better dentists are being graduated now than formerly. Better educated men are entering the profession, and it behooves each one of us to be more and more studious as the years roll by. This does not mean to study only subjects pertaining to dentistry alone, but all branches of the healing art, as well as world events.

I wonder whether a few remarks would be amiss about taking care of our earnings, should there be anything left over after our expenses are settled.

The net worth of the dentists of Georgia, not including inheritances, in 1929 according to their own figures was \$1,387. This is after an average of over fifteen years in practice or at a saving of less than one hundred dollars yearly. When these figures are earnestly studied and the really pitifulness of them is revealed, I think that surely no one would fail to be interested in his later years.

Do not imagine that you are lucky on the boards. Only about 2 per cent do any better than break even with speculation; so do not suppose that you can beat the ninety-eight out of each hundred. It has not been done recently to any great extent. Instead, do you not think it would be better judgment to select some conservative form of saving and steadily lay away your savings and conscientiously stick to it? If you doubt it, use your power of observation and see among your own confreres the men who ought to be almost independent but instead are hopelessly on the rocks. In the long run, it will without question give you a more substantial success.

This applies to every phase of your life. In this day of defaults and general let-down of credits, I think that the man who lives up to his ordinary obligations in a plain prompt manner is outstanding. By this I mean that if you have a note due on a certain day, be right there; and if it is not possible to retire it, give a satisfactory excuse. In other words, show your creditor that your heart is right and your intentions are honorable. I have never seen a supply house manager or a banker unwilling to lend a helping hand when approached in this manner.

REPORT OF THE COLLEGE COMMITTEE OF AMERICAN SOCIETY FOR THE PROMOTION OF DENTISTRY FOR CHILDREN*

THE Constitution and By-Laws of this Society state: "The purposes of this Society shall be the advancement and dissemination to the profession and the public of knowledge of all phases of Children's Dentistry, and in particular its relation to general health."

That health is the nation's greatest asset, none can deny, and especially for the thirty to forty million children growing up to young manhood and womanhood in our midst.

Dentistry, as a natural division of public health service, should be included in any modern health program, and its importance as such is steadily becoming more and more recognized. Several committees of large scope and influence have included the importance of dentistry in their final reports. The Committee on the Costs of Medical Care, states: "Dentistry increasingly is regarded as an important branch of health service rather than a mere mechanical service for the maintenance and restoration of dental functions and facial comeliness. Dental disorders are directly related, both as effect and as cause to general health." That dentistry is properly a form of health service, is also stated in the Carnegie Foundation for the Advancement of Teaching, Bulletin 19, "Report on Dental Education in the United States and Canada," in discussing the correlation of medicine and dentistry. It states: "Dentistry is an important mode of health service, and in general it is quite as significant for the maintenance of health as some of the accredited specialties of medical practice." The Commission on Medical Education, a study group organized in 1925 by the Association of American Medical Colleges, which rendered its final report in December, 1932, says in part regarding dentistry: "The important place which oral hygiene and diseases of the dental structures occupy in the health program, and the close relationship which exists between oral conditions and other functions of the body, point to the necessity of correlating medical and dental practice and education."

Congress authorizes the President each year to proclaim May 1 as Child's Health Day, the purpose of which is to arouse the parents and children to the child's natural heritage of a healthy body and a sound mind to the end that, "Every child in the United States of America shall have health protection from birth through adolescence, including: periodical health examinations and where needed, care of specialists and hospital treatment; regular dental examinations and care of the teeth, protective and preventive measures against communicable diseases; the insuring of pure food, pure milk, and pure water.

"For every child from birth through adolescence promotion of health including health instruction and a health program, wholesome physical and mental recreation, with teachers and leaders adequately trained."

The officers, committees, and members of the American Society for the Promotion of Dentistry for Children, recognizing these above-mentioned situations and also seeing the unusual opportunity to work in the interest of the children of the nation, a few years ago, set about to effect the sentiments stated in the preamble of the Constitution and By-Laws, mentioned at the beginning of this report.

One phase of the problem was delegated to the College Committee; and in 1928 this committee, under the chairmanship of Dr. Leroy M. S. Miner, began to gather information regarding the status of children's dentistry in the dental schools of the country, for the purpose, said Dr. Miner, "to classify and analyze this information as a starting point for the development of interest in the promotion of an educational program of merit." Accordingly a questionnaire study was made by sending an explanatory letter, on November 3, 1928, with a questionnaire to the dean of each of the 43 dental colleges in the United States and Canada. The material gathered from this survey was reported at the meeting of the American Association of Dental Schools at Washington, D. C., in 1929 and more fully in Toronto in 1930.

*Presented at Chicago, August 7, 1933.

An analysis of this report disclosed the following facts:

1. That of the twenty-nine out of the forty-three schools replying to the questionnaire, only six schools had a chair in children's dentistry—though twenty-eight stated they gave clinical instruction in the subject.

2. The second phase of the report involved the method of teaching children's dentistry, and the question of whether it shall be a department in itself or a division of another department—and these questions were found to be essentially an administrative problem in each school. However, there seemed to be rather a general agreement that it was undesirable to teach it as a specialty, but rather as an important part of the general practice of dentistry, i.e., operative dentistry, preventive dentistry, or oral hygiene.

This first report attracted a great amount of interest and brought to the attention of the teachers in the dental schools the fact that the American Society for the Promotion of Dentistry for Children was actively interested in projecting the teaching of children's dentistry in the schools of this country.

At the 1931 meeting of this Society, in Memphis, the members suggested that as several years had passed since the last survey, another one should be made in order that the information be brought up to date and serve as a basis for action during 1932, and for

TABLE I

A COMPARISON OF THE STATUS OF CHILDREN'S DENTISTRY IN 1928 IN THE DENTAL COLLEGES WITH THAT OF 1932

	NO. OF DENTAL SCHOOLS	NO. THAT REPLIED	NO. HAVING CHAIR FOR CHILDREN	NO. HAVING SPECIAL LECTURE COURSES	NO. HAVING SPECIAL CHILDREN'S CLINIC	NO. GIVING CLINICAL INSTRUCTION	NO. GIVING GENERAL LECTURES ON CHILDREN'S DENTISTRY
In 1928	43	29	6	18	13	28	21
In 1932	43	38	13	24	16	36	34

I. Where the special lectures in children's dentistry were given

In 1928	In 1932
6 in Department of Operative Dentistry	10 in Department of Operative Dentistry
3 in Department of Preventive Dentistry	4 in Department of Oral Hygiene
1 in Department of Research	2 in Department of Orthodontia
8 had special departments	8 in special departments
Total 18	Total 24

II. Where the general lectures in children's dentistry were given, in addition to the special lectures

In 1928	In 1932
3 in Department of Operative Dentistry	7 in Department of Operative Dentistry
	1 in Department of Orthodontia
	1 in Department of Preventive Dentistry
	1 by staff of Clinical Pedodontia
21 Schools gave lectures in the subject.	34 Schools gave lectures in the subject.

III. Deductions

In 1928 twenty-two schools gave no lectures in children's dentistry, and fifteen gave no clinical instruction in the subject.

In 1932 nine schools gave no lectures in children's dentistry, and seven gave no clinical instruction in the subject.

recommendations at the Buffalo meeting in September, 1932. In accordance with this suggestion, the College Committee, in 1932, proceeded to gather new data and brought information regarding children's dentistry as taught in the dental colleges of America up to date and rendered a report to this body in Buffalo, September 15, 1932.

The conclusions disclosed in that report were as follows:

1. That of the thirty-eight out of the forty-three schools replying to the questionnaire, thirteen schools (an increase of seven since the first survey was made) had a chair in children's dentistry; sixteen had a special children's clinic; thirty-six gave clinical instruction in this subject; twenty-four had special lecture courses; and a total of thirty-four schools gave lectures in the subject of children's dentistry.

2. As to the trend in the method of teaching children's dentistry, it seems to be toward teaching the subject as a distinct unit, separate from the departments of operative dentistry, preventive dentistry, or oral hygiene—a reversal of opinion from that revealed by the first report. Also, there is an indication of a trend to coordinate the teaching of children's dentistry and orthodontia. (See Table I.)

The College Committee notes with pleasure a growing tendency on the part of the dental colleges of today in taking greater interest in teaching the subject of children's dentistry—with more attention being given to the development of special clinics, special lecture courses, and especially in establishing definite clinical requirements in the subject.

At the meeting of this Society in Buffalo, 1932, the report of the College Committee was accepted, and a copy of it was mailed to the deans of all the dental colleges and the secretaries of the state boards of dental examiners of the United States and Canada; and the Committee was continued with an additional member, Dean L. E. Ford of the College of Dentistry, University of Southern California, to advance the educational program as much as possible for the ensuing year.

In keeping with this idea, the College Committee makes the following recommendations to the Society at this time:

First: That a Reference Committee on the Teaching of Children's Dentistry in Colleges be appointed by the president to receive the College Committee's report. The duty of this Committee shall be to analyze carefully the report and to be prepared to bring to the Society recommendations and/or resolutions on vital matters that may be contained in the report when made.

Second: That the College Committee's Report shall be revised and brought up to date at least once every four years—at which time copies shall be mailed to the deans of dental colleges, secretaries of state boards of dental examiners, and editors of the leading dental journals.

Third: That the tentative College Committee be instructed to formulate a suitable schedule, as to both didactic and clinical requirements, for adequately teaching children's dentistry in the dental colleges. Such schedule to include the technic or technics to be used, and shall list the textbooks on the subject.

Fourth: That on every occasion possible honorable mention be made of the specific gifts given to children's dentistry by Dr. Howard S. Lowry, of Kansas City; Colonel Joseph Samuels, of Providence; Dr. Delos L. Hill, of Atlanta; and the benefactions of the Forsyth brothers, of Mr. George Eastman, of Mrs. Montgomery Ward, of Mrs. George Carter, of Senator Couzens, of Murry and Leonie Guggenheim, and others in which dentistry for children has shared and may share from time to time.

Fifth: That the American Society for the Promotion of Dentistry for Children record its thanks and appreciation for these benefactions to the cause of children's dentistry; to the dental colleges for taking an increased interest in teaching children's dentistry; to those dental journals giving space to articles on children's dentistry; and to those who have and are devoting so much time and thought to writing articles and textbooks on the subject of children's dentistry.

In addition to the above recommendations, and in concluding this report, the College Committee respectfully submits the following resolutions:

The American Society for the Promotion of Dentistry for Children desirous of assisting, wherever possible, in the creation of better conditions for the health of the children of the nation, records the following statements relating to dental health service:

WHEREAS, dentistry is primarily a health measure and since so much time and effort of the dental profession have been devoted to restorative and reparative dentistry, and,

WHEREAS, the hope of the future for better oral care lies in prevention and early care of the teeth and associated tissues, and,

WHEREAS, children's dentistry is the logical field for preventive measures because of the age of the child and at a time when oral care is most needed and does the most good, and,

WHEREAS, dentistry is a natural division of health service, and is being recognized more and more as indispensable in any modern public health program, and,

WHEREAS, we cannot expect to educate the child to the value of systematic and periodic care of his teeth until the members of the dental profession are taught their responsibility in such matters; therefore, be it

Resolved, That the dental colleges of the United States and Canada be importuned to teach children's dentistry, both clinically and didactically, as a part of the dental curriculum, and that state boards of dental examiners be asked to include questions on dentistry for children, preventive dentistry, and operative skill and knowledge in handling children; and be it further

Resolved, That dental students and members of the dental profession of the United States and Canada be taught the following principles of prevention:

1. Children's teeth should receive special attention between the ages of two and fourteen years.

2. Initial defects should receive careful and prompt attention, since no cavity is to be regarded as being too small to fill.

3. Pits, fissures, and V-shaped grooves should receive special attention in both deciduous and permanent teeth before caries starts.

4. Guard against exposed pulps in both deciduous and permanent teeth by preventing decay through regular systematic and periodic examinations; and be it further

Resolved, That since these ideas are in keeping with the best known thought and practices of the day, to ignore them constitutes a violation of professional knowledge and principles and may subject the patient to loss or impaired function, and be it further

Resolved, That the members of this Society declare for the principles and practices of children's dentistry as herein above set forth and respectfully request all members of the dental profession to adhere to and abide by these principles, and to do everything in their power to advance and disseminate to the profession and the public knowledge of all phases of children's dentistry, and in particular its relation to general health, and be it further

Resolved, That a copy of these resolutions shall be displayed in the office of every member of this Society and a copy sent to the various state departments of health, to the United States Government Bureaus, to state departments of education, to the deans of the dental colleges, secretaries of state dental boards, editors of dental journals and secretaries of the state and national dental organizations, to the American Association of Dental Schools, and to all health organizations and welfare workers.

Respectfully submitted,

L. E. FORD,

LEROY M. S. MINER,

H. E. FRIESELL,

A. R. McDOWELL, Chairman.

PEDIATRIC PSYCHOLOGY AND THE CHILD GUIDANCE MOVEMENT*†‡

JOSEPH BRENNEMANN, M.D., CHICAGO, ILL.

THE fact that a psychiatric society has asked a pediatrician to address it would seem a hopeful symptom in these rather troubled times. It apparently recognizes the need for sympathetic cooperation between the psychiatrist and the pediatrician, each approaching the same problem from a different angle, in the hope that they can meet on common ground in a spirit of mutual helpfulness. That a speaker for such an occasion should be chosen who has no special interest in formal child psychology and psychiatry and who has had even less formal training needs explanation. There are naturally two normal approaches to the acquisition of useful knowledge of child psychology and psychiatry—that of the psychologist and the psychiatrist from without, that of the pediatrician and family doctor from within. To insure normal, safe progress the contributions of each should be welcomed by the other as complementary to his own, as is done in analogous situations in medicine. My present concern, then, is to meet the request of your president to present a pediatrician's viewpoint and reaction to the current widespread interest and activity in the field of child psychology and psychiatry, with the hope that it will stimulate discussion that may help to clarify a matter that, I think, seems a bit confused to all of us. I shall try to tell you how the matter looks to one who is neither psychologist nor psychiatrist, but who for many years has been interested in the practical observation, interpretation, evaluation and therapy of mental processes, reactions and behavior in children as one constantly and necessarily encounters them in pediatric practice in the home, in one's own family, and in the ordinary social contacts of life. In doing this I shall stress especially the inevitable lay reaction to such movements that experience with analogous situations can confidently lead us to expect in this instance. I have chosen the broad title of "Pediatric Psychology" to include all of the psychologic reactions that the pediatrician or family physician encounters in practice, with which he alone has a first-hand familiarity, and that have an important bearing in this connection.

Perhaps you will pardon me for introducing a personal matter, both because it was doubtless back of the invitation that has brought me here, and also because it will help to visualize rather concretely some of the aspects of the present status of the psychiatric situation. Two years ago I was invited to address the New England Pediatric Society in Boston. To those of us in the hinterland of culture an invitation from that source is a command. I proposed several pediatric subjects and as a sort of afterthought I mentioned "The Menace of Psychiatry." That subject was chosen at once. That was somewhat encouraging but also some-

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†From The Children's Memorial Hospital, Chicago, Illinois.

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what terrifying. I had long had some vague subliminal ideas on the subject that had never come to full consciousness, and a few very decided convictions. I was apprehensive about being able to express what had hitherto been inarticulate and I feebly tried to get out of it. Between my own real inclination, however, and further encouragement from a high and authoritative pediatric source I was jockeyed into going. I went, but like Paul before the Corinthians, "in weakness, and in fear, and in much trembling." I am still bewildered at the reception accorded that paper at the time and subsequently. I am inclined to believe that if I read to you the several hundred letters that I received from pediatricians, general practitioners, laymen, psychiatrists, nearly all of them asking for several reprints to distribute at strategic points, it would give you a better insight into the whole subject than I can in any other way. A well known publisher asked me to expand and mould the paper into a book, evidently thinking that there was enough question about the present trend of things to make a warning and a protest convertible into dollars and cents. When I declined because among other reasons it would seem illogical to add one more small item to a confusion that already seemed to exist, he suggested that what was needed was "a book to stop more books." An eminent English pediatrician wrote me: "I have just read with much approval your paper on the *Vis Medicatrix Naturae* and The Menace of Psychiatry. I find myself so much in sympathy with your point of view that I am venturing to send you two reprints of my own in which the same sort of doctrine is preached. It is badly needed in this country though not so badly, I fancy, as in yours." Among others came a letter from your president, asking me as a pediatrician to state my "views concerning some of the newer psychiatric vogues in their relation to pediatrics." When he added that my former address "was read with great pleasure" and that in it I had "struck a note which was very responsive" I readily accepted the invitation. I am not citing all this because I have any false notions as to the intrinsic value of that paper. It was a jumble of things with many angles, some one of which was bound to hit some one favorably, and people love to see their own views in print. Unfavorable reactions, too, were probably not expressed as freely as the others. And yet it gives one "pause to think."

Even without such evidence I think it is rather clear to all of us that there is some confusion and not a little bewilderment in the child psychiatry world today. That things will get worse for a time I think one can safely predict. That not a little harm will come for a time, but more final good, can be expected with calm assurance. There is nothing unique about the present wave of activity. The history of medicine is largely a history of the rise and fall, often only the decline, of such movements. Pediatrics has had more than its share. The present epidemic, to change the metaphor, has apparently assumed pandemic proportions. It is probably more virulent in this country than elsewhere because it has fallen on virgin soil.

The question naturally arises why does such a movement arise, or gain a greater momentum at a given time as compared with some other time. I think the answer is not hard to find in the present instance, and in that answer lies the source of nearly all our troubles. Probably in nearly every age to which human records bear witness each receding generation has thought that the oncoming

generation was living at a new and perilous pace. Even pastoral Concord of the forties was too much for Thoreau and he moved to Walden Pond. In spite of this I think one can safely say that there has been no previous epoch in the history of the world in which such momentous changes in man's environment and in his whole resulting mode of living have followed one another in such quick succession as in the present epoch. No discussion of the movement under consideration can fail to take cognizance of this as a fundamental factor in its genesis. The machine age does not interest us now in the sense of looms, cotton gins, steel mills, or big business, so much as in the fact that it has suddenly made a tremendously complicated, nerve taxing, high tension, raucous world on the one hand, and an enormously expanded, and paradoxical as it may seem, contracted world on the other hand. Within a generation, or two, distances have been annihilated. In that short space of time the steam engine, the gasoline engine, gas and electricity in all its phases, have contributed each from a new angle to give full measure to the complexity and speed, and noise, and danger, and wideness of interest of life. In that short space of time we have had to adapt ourselves from a simple, almost pastoral life to one that is a seething maelstrom of activity. There is no longer any unbroken peace and quiet and leisure. The telephone, the automobile, the radio and the doorbell have seen to that. Life has become dynamic, instead of static, or a wholesome mixture of the two. The business man knows from statistics that competition has made the chances of success numerically against him, and that adds to the "tumult and the strife." The machine has broadened our interests and widened our knowledge but it has left us little leisure to think and to acquire wisdom. Our pleasures are so multiplied and so easily accessible that the keenness has gone out of them. We have forgotten or have never known that it is the paucity, not the multiplicity, of pleasures that gives them zest and makes life enjoyable. I called one Christmas morning to see a poor little rich girl of six or seven years. The Christmas tree was so tall that it had to bend over, and the room looked like the toy shop at Field's or Wanamaker's. The little girl was so bored that she yawned. About the same time there appeared a cartoon of McCutcheon's, with the legend "The Toy She Loved Best," showing a little girl on Christmas morning hugging a rag doll labeled "from the Janitor." A few years ago a foolish rich mother who surrounded her five-year-old daughter with every luxury said to her one day, "Oh! see the aeroplane." The little girl did not even look up, and said, "Why should I look at it. I'll see those all my life." It was once the children of the rich only who had everything and became blasé before their time and demanded ever new pleasures, often to their ruin; today a child does not have to be rich to be overstimulated and then palled by a multiplicity of pleasures and activities. It is one of the common experiences for little children who have an overabundance of opportunity for amusement to get bored and to say to their mothers, "What will I do now?" or "There isn't a thing to do that's any fun."

The radio and the movie are doing their full share in adding to the complexity of domestic life. Why should a child study when he, or rather, she, can hear Rudy Vallee crooning on the radio, or why not combine the two? Why not

go to the movie, and often, when it costs so little and is just around the corner? If the mother is a bit old-fashioned and thinks that "Stepping Sisters," or "Ladies of the Big House," or "Lady With a Past," or "Her Only Sin," or "Strictly Dishonorable," or "The Greeks Had a Word for Them" are not suitable for children, conflicts arise that commonly lead to yielding against futile protest, or to denial, with resulting sullenness or rebellion, and ill-disguised pity that one should have to be dominated by an atmosphere so mid-Victorian.

Add to this the fact that it is no longer safe to let a young child, who is normally as outdoor an animal as a collie, play outdoors without constant surveillance. The automobile alone kills some 90 people a day, one every 15 minutes, over 34,000 a year, about two-thirds as many as we lost in the World War. And there were 997,600 accidents. Even more sinister agencies haunt the rich, as we have good reason to know. Constant surveillance leads to a daily or bidaily all-dressed-up outing with a guardian, about the nadir of wholesome entertainment for a normal child. Confinement in a yard, even if large and in a suburb, irks him as it did Rasselas in his beautiful but walled-in Paradise. He wants freedom to go out alone to seek chosen companions, the only normal social intercourse for a child. But the streets are no longer safe and mothers are apt to be hypercritical about his "chosen companions." Many of our suburbs, even, have made almost no provisions for playgrounds, or if they have the "trained recreationist" can easily take the normal spontaneity out of the fun of playing that under normal circumstances organizes itself unaided from within. The necessity for eternal vigilance outdoors, and for constant inhibitions and denials during the longer hours indoors, makes for shattered nerves and broken discipline on the part of the mother and successful rebellion against authority and for domination on the part of the child. The bride's rosy dream of a big family often leads to a rude awakening. As a result our families have steadily dwindled in size until the one-child family, in which all behavior problems reach their acme, is no longer a rarity. The old-fashioned family, with many children normally spaced, was an independent social community in itself.

One of the deadliest of all the effects of this machine age in this connection is the mechanization of life itself. Man is by nature a free being who chafes and rebels under restraint. He may not have the slightest fondness for strong drink but let an outside authority impose an Eighteenth Amendment and a Volstead law on him and he forthwith seeks out a bootlegger and carries a hip flask. The complexity of life has made mechanization necessary and, though grudgingly, we adjust ourselves to it. We are getting used to red, amber and green lights in most of our activities and the end is not in sight. The child cannot as yet grasp the necessity for red and amber lights. Green is his natural color and he wants it on all the time. He protests against having his normal play interrupted to practice his music or go to a dancing school at a fixed hour; to having his neck and ears washed, his hair combed, even his nails attended to, having to be dressed up and kept clean to meet a possible social exigency, when all these manifestations of an adult sense of duty and propriety made necessary by the compactness of social contacts, differ so fundamentally from his own normal ideas of the optimum conduct of life. Even having to play at a fixed hour a fixed

game gets, and merits, a protest. And now he must even go to a doctor every so often, especially on Saturdays, for a periodical health examination, when he seems to be so healthy and full of life. It is hard for him to adjust himself to queer restrictions of diet and to such silly things as rest periods that are not restful. Mechanization of activities normally leads to conflicts; a child that under such conditions does not present conflicts is a dud—he will never make a noise in the world.

I am constantly reminded of my own childhood on a farm. There were five of us so spaced that we easily tolerated one another. Our pleasures were the simplest, the high spots so rare that they were keenly appreciated. A trip to town was an event. The annual circus was something to look forward to for months and to live over for months more. The anticipation that the proverb says exceeds the realization was directed to the marvelous posters of lions and tigers and "blood sweating behemoths" and lovely spangled ladies all jumbled together in gorgeous colors. Once we made a voyage to Chicago, a hundred miles away, an unforgettable event. Our social life consisted in having company, or going visiting, on Sundays, occasionally. School was great fun, and the annual literary entertainment at the school has never been equalled by anything since. Christmas was the great event of the year and it didn't do us any apparent harm to believe in Santa Claus and we had no damaging psychological reaction when the deception was finally discovered or revealed to us. Our playthings were largely of our own make. It was fun to get in the cows in the evening and to feed the pigs. Our sunsets were gorgeous and plainly visible. We had no "bull frogs," with due apologies to our Senator from Mississippi, but we were keen observers of "the love life" of the domestic animals. The "hired man" supplied the rest and I am not sure that it did us any harm. We were no problem, there were few inhibitions and as a consequence no serious rebellion and no serious conflicts, at least not above the surface. We obeyed naturally and implicitly, as a rule, and were rarely punished. We ate what was set before us—it was expected and was done. We read a great deal, carefully and appreciatively and repeatedly, because we did not have the deadening multiplicity of books of the present time, when children go to the library and bring home an armful of trash for the week-end, while Dickens and George Eliot and Thackeray and Shakespeare gather dust undisturbed on the shelves at home.

A transition such as I have depicted, that has taken place within a few decades and is probably still gaining momentum, inevitably presents a problem of which our individual psychiatric problems are legitimate offspring. It is no simple problem. It exists and must be met on its own terms. The simple life has gone and will probably never return. I am not lauding "the good old days," nor deploring the present. "Fifty years of Europe" is doubtless "better than a cycle of Cathay." It does, however, seem to me to be important to keep in mind in facing the problem before us that it is new and enormously big and that it will require "wary walking" if we are not going to do more harm than good by our method of approach. It is too much to hope, even less to expect, that there will at all times be the wisest procedure and cooperation among the manifold and multiplex agencies that are concerned in the solution of the problem.

Its very nature and complexity preclude such a possibility. It can, furthermore, no more be solved alone by what may seem to be logical procedures based on scientific data obtained by the laboratory method, than one can remove the economic depression by analysis, or by legislation or exhortation. We are not dealing with fixed mechanical things that follow known laws, we are dealing with psychology, and even more with that intangible and unpredictable thing, mass psychology. Even though one may have no ready solution to offer, one can at least record certain observations, point out certain dangers that seem inevitable in the light of past experience with analogous situations and make some suggestions as to what would seem a proper approach to that solution.

In approaching a problem of this kind there are two self-evident desiderata: We must acquire useful knowledge as to the fundamentals, and we must apply that knowledge in practice. In acquiring useful knowledge there are again two natural methods of approach—from within and from without. The two types of knowledge so gained are not identical nor coextensive one with the other. To be useful, I might even say, to prevent disaster, information obtained from each source must be complementary to the other. The pediatrician and the family physician only can approach the problem from within. Their knowledge of the situation is unique and to my mind indispensable. They alone have a first-hand knowledge of the normal habitat of the child. They alone are familiar, through mass experience with the psychology of the home in general, and with the particular home in which a problem arises. They see the latter in its incipency, they know the atmosphere that surrounds it, they are in the unique position of preventing it by sensing the probability of its occurrence if not forestalled by timely advice. They are on a friendly, sympathetic, confidential basis with the whole situation. The child is a friend and a patient, not a case. They, alone, likewise, are practically familiar with the reaction of lay psychology to propaganda from without that cannot be usefully digested and assimilated, and therefore often leads to serious trouble. Unfortunately this knowledge is assumed as a matter of course, is rather intangible and unclassifiable and therefore does not lend itself readily to transmission to others. The pediatrician and the family physician, too, have not become as conscious and mindful of it as an essential factor in their dealing with the child as would seem desirable.

The other method of acquiring useful knowledge is from without—by those especially interested in psychology, psychiatry, child guidance, mental hygiene and behavior. It is the laboratory method of approach, carried out in the psychiatric clinic and practice, in the child guidance clinic, and in the nursery, kindergarten, preschool and school. It leads to a classified knowledge of normal and abnormal behavior of the child under various conditions. Such knowledge is of great interest and value, *per se*, as is all knowledge. To be practically useful, however, it must be restrained, transformed, and mellowed in its practical application if it is not to do more harm than good when it encounters what I have called “pediatric psychology.” Studying newborn babies in the nursery and determining that they have only three primary instincts does not necessarily fit a man to give sane practical advice to parents, or to try to save the “institu-

tion of parenthood" from its complete failure by suggesting that "it would be better if there were no more babies for twenty years or only a few for experimental purposes." The child guider who sees "sex tension" in "enuresis, unprovoked tantrums, night terrors, cruelty to other children and to animals, wanting to be with parents especially at night," is not, *ipso facto*, a safe purveyor of advice to mothers. I think it might be stated more forcibly. But even the knowledge so obtained that is unquestioned both as to its soundness and as to its ultimate practical usefulness cannot be foisted wholesale upon the laity without danger of adding fuel to the flames instead of quenching them. Especially is this true when the spread of such information bursts beyond legitimate confines and assumes the proportions of a propaganda in which half-baked enthusiasts, both among the laity and among those inadequately trained, take upon themselves the responsibility and the duty of carrying the torch of enlightenment into the home. It does not add to the safety and usefulness of such information to have it broadcast while it is still in a transitional stage of confusion and is obscured in strange verbiage, concepts and practice, that bewilder not only the laity but also the practicing physician who tries to be well informed and useful in all that pertains to his contact with the family in the home.

The pediatrician who looks out upon the whole subject from the vantage point of the home readily sees a striking and instructive analogy to other situations through which he has passed and which he has outlived. Stressing this point will help to save me from what might otherwise seem an assumption of arrogance when I attempt to speak to you on the subject before us. The development of our knowledge of infant feeding and of its practical application in the home perhaps best lends itself as an illustration. It, too, was a new and a big problem that came upon us rather suddenly, largely, too, from necessity. There was the same division, as in the present situation, into those who constituted the ultra-scientific group, who studied the problem in the laboratory, or, at least, by the laboratory method; and on the other hand, the pediatrician and the general practitioner, who tried to make out what it was all about in the attempt to put it in practice. In some instances the two groups merged; in others they pulled farther apart. The whole thing became increasingly more complicated. Herod was outtheroded in offering ever new and more complicated solutions of what and how to feed a baby. It became a problem of mathematics, in which we went at least as high as algebra—some one has said that we once touched logarithms. I cannot vouch for the latter but I do know that for some years, about twenty-five years ago, I carried in the back of my pocket notebook a series of algebraic equations by which I calculated the amount of milk, cream, whey, sugar and water necessary to give a baby the percentages of fat, protein and carbohydrates that I assumed were appropriate for his present age and state of digestion. We even split the protein and debated between one and one-half and one and two-thirds per cent of fat in a given formula. As the thing went on some of our textbooks and magazine articles on infant feeding looked like a treatise on mathematics or astronomy. On top of all this there was imported and widely adopted a thing called the energy quotient, which involved a second mathematical calculation to determine how many calories per kilogram or pound

of weight a baby of a given age and weight could safely tolerate. Jacobi, who was one of the few among authorities who did not follow these mathematical vagaries, summed up the situation in a characteristically incisive manner by saying that we "fed babies by mathematics instead of brains." There was the same spread of information to the laity as in the present instance from many and various sources, and the same eager acceptance of anything that had a "scientific" background and smacked of the laboratory. The effect of this on the laity I shall take up presently.

To the practicing physician there was endless confusion and, inevitably, continuous change in procedure as new discoveries were announced. A surgeon once asked me: "What are you feeding babies *today*?" and I could not logically resent the implication. Another time a young practitioner who was eager to be up to date came from a distance to spend a few weeks in our clinic to learn how to feed babies by the so-called "Percentage Method." He had never been able to master it while a student. He told our dietitian his plans and expected a sympathetic welcome. She was a bit brusque as she told him: "Why, we aren't feeding percentages any more." He was stunned for a moment, then let out a good round justifiable oath, walked out, and never returned. The reaction to the complicated problem of this kind was, and probably always will be the same by those physicians directly concerned. The pediatrician whose whole interest was in the child, buckled down and tried to master the intricacies of infant feeding. Some of the general practitioners did the same. The rest of them, nearly all of them, and therein lies the danger of all such developments during the complicated transition stage, chucked the whole thing and followed the safer course of prescribing one infant food or another that gave full directions to the mother on the wrapper that came with it. As usually happens, a period of increasing complexity was gradually followed by a period of increasing simplicity. The pediatrician is today actually embarrassed at times in deciding which one of so many simple ways of feeding a baby to choose in a given case. In the wake of this development innumerable psychiatric problems have arisen that will take years to live down. The pediatrician has played into the hands of the psychiatrist. It is not unreasonable to speculate as to what the psychiatrist will do in an analogous but far more delicate situation, in which not the body but the mind itself is involved.

The second desideratum that I have indicated is that of applying our knowledge of psychology and psychiatry in practice. This naturally involves the pediatrician and the family physician on the one hand and the psychiatrist and his auxiliaries on the other. Ideally the matter seems very simple and I feel confident that the ideal will become a reality in time. The pediatrician, and I will hereafter include the general practitioner in that term for the sake of brevity, is a general practitioner to the young. He is a unique kind of a specialist. He has expert special knowledge on most phases of child care that no one else has, or can have. In other matters he is only the first line of defense. This implies an adequately useful knowledge of all things that pertain to the care of children so that he will know what he himself can handle advantageously on the one hand, and what he ought to refer to a specialist in another line on the other hand. Where he will draw the line must be left to his experience and to his con-

science. I see no reason whatever why the pediatrician who is on the ground and knows the child and his family should not try to meet a psychiatric situation as it arises, or even better, forestall it before it arises. I see also no reason why he should not, after due deliberation and possibly a trial of his own, refer the serious case to a psychiatrist, just as he would a brain tumor to a neural surgeon, or an appendicitis to a general surgeon. I am convinced that in our present stage of development it is well to have a buffer between the mother and the psychiatrist. In our clinic at The Children's Memorial Hospital every child is referred first to a pediatrician. If after careful examination and due deliberation he decides that the child should have psychiatric care he refers it to the psychiatric clinic, sometimes for consultation, usually for full care in that clinic. In private practice he naturally pursues a similar course. I do not believe that psychiatry, or psychiatrists, alone, are any safer, as yet, with a child than is any other specialty or specialist. As an illustration of the importance of cooperation and of danger without it, I might cite the following: We had a young girl at the hospital with a coarctation of the aorta, with a resulting blood pressure of over 200 above the point of narrowing. The school nurse, who is the first line specialist in tonsils, wanted the child's tonsils removed. We emphatically refused to do this because the child had had several cerebral hemorrhages due to the high blood pressure. The nurse took her to another specialist, an otolaryngologist this time, who removed the tonsils. Fortunately the child did not die. Analogous occurrences are just as apt to arise in the psychiatric field. A little boy of ten years came to our pediatric clinic with a diagnosis of chorea of some weeks' standing. He still had choreic movements and the diagnosis was confirmed. Several years before he had been kidnapped by some boys and held for several days. On another occasion he had been beaten up by some colored boys. He was timid, fidgety and unsocial. For this he was referred to the psychiatric clinic. He came back with a diagnosis of "Apprehension," and his mother had been advised to send him away to some distant relatives so that he might start all over again in a new environment on an equal footing with new playmates. Such advice could hardly be considered safe by a pediatrician, who knows that chorea needs rest and that it presents an incidence of over 50 per cent of cardiac involvement, which at that age has a mortality of at least 25 per cent within a few years of onset. The chorea demanded attention, the problem of some years' standing could easily wait. These illustrations are on a purely physical or borderline plane in which the pediatrician's authority is unquestioned. But even in purely psychiatric problems there is an advantage in a preliminary appraisal by a pediatrician who has a first-hand, inside knowledge of the whole environment in which they have arisen, provided, however, that he is alert to the situation and is reasonably able to meet it.

To what extent is the pediatrician prepared to assume this initial responsibility? I would say nearly, but not quite, as fully as in other fields of medicine. I think he has a little more of an awareness of the situation than he is credited with having. Assuming, however, that he has not, what is the course to pursue? To my mind there are clearly two things: he must be made psychiatry conscious, psychiatry minded, he must be led to think of the child as a whole with a mind

inseparable from his body, and that psychiatric problems are medical problems as fully as is measles, or pneumonia; second, he must acquire a deeper knowledge than he now has of the fundamentals of child psychology and psychiatry. The former of these two will come inevitably from its own innate momentum. It is in the air. "Necessity is the mother of invention." If the psychiatrist does not make the whole thing look too big he will tackle it to a useful degree. If on the other hand he gets the impression that the solution of a psychiatric problem necessarily requires a complicated machinery of procedure involving a psychiatrist, a psychiatric worker, and a psychologist; that the cost may amount to \$500 per patient as in one guidance clinic; that it is necessary to ferret out the sex life of the ascendants for two generations to find out why a child lies, or steals, or runs away from school, or is apprehensive, then he will be slow to fall in line. I am afraid that if he ever tries to balance an "Ego-Libido Equation" he will be found wanting, just as he was in the days when he tried to feed babies by higher mathematics.

The need for a deeper knowledge of child psychology and psychiatry can, and will be met in several ways. In a few years no reputable medical school will be without a practical course in these subjects. Time, too, will work out the problem of whether the teacher will be a psychiatrist, or (and) a pediatrician, or perhaps better still that logical product that may loom big in the future, the pediatrician who specializes in psychiatry. Once awakened to the necessity for such information and having acquired an interest in it, he will seek further help through reading and attending special clinics. There is already a tendency among internes and residents as they leave the hospital after a pediatric internship to take special work for a time in a psychiatric clinic. Some of these will ultimately specialize in psychiatry for which the background of their pediatric experience will make a foundation second to none other.

I cannot help but think that during the formative period of this psychiatric activity it would be well if information on this subject would be directed only to physicians and to those especially interested, and not to the laity except in the most simple and elementary form, carefully avoiding all matter of controversy. The physician would then be a sort of middleman here, as he is in all medical matters. No one in his right mind ever told *mothers* in a book what to feed their babies. That was an individual matter. On a former occasion I ventured to say: (1) "In actual practice the young mother with a nutritionally untutored mind who frankly states that she knows nothing about babies and leaves the instruction to me is a treasure; the mother who has perhaps specialized in dietetics while in college and who approaches the subject with a McCollum in one hand and a Gesell in the other is sometimes more of a problem than is her baby." *Verbum sapientibus satis* is a happy combination of words, but it has never yet stemmed the tide in a situation such as now confronts us.

This brings us to what seems to me the most important aspect of the whole matter—the inevitable lay reaction to new and widely applicable advances in medicine in which the laity are interested and in which they can participate. In the present instance our interest centers in the mother and her child—the father has become rather increasingly negligible in this respect in our domestic evolu-

tion. It is the mother who carries the burden of child rearing and she takes her job seriously. She wants him as nearly perfect in every respect as scientific puericulture can make him. She loves science, and she likes it raw. She went dutifully and characteristically at the job of seeing after her child's physical welfare with the aid of her pediatrician and many outside agencies. In one way they did the job well, in another they made a mess of it. She is now becoming psychology and psychiatry minded, largely, I am inclined to think, because of her experience in the realm of nutrition. I can perhaps best illustrate what I mean by citing one of many similar instances. A very earnest and intelligent mother has three children, 20, 18 and 3 years of age. She never had any serious trouble of any kind with the two older children. There was never any behavior problem. They are children of whom she can well be proud. In medical matters that came up when they were babies, and later, she consulted her family physician only as seemed necessary. The youngest child had hardly had its cord tied before she was told that she must have a pediatrician. Characteristically dutiful and progressive she had an excellent pediatrician right away. She moved to another suburb after a time and had another equally good pediatrician, whom she saw periodically. When the baby was about 11 months old she came under my care. She was pathetically thin and a problem of the first water. I could make out no organic trouble. She refused to eat anything and everything unless coaxed or forced to do so—chiefly the latter. She was hopelessly spoiled. Her mother from a rather placid individual has become a wreck, whose life centers in that child. She knows what she ought to do but she can no longer bring herself to do it. She presents a greater problem than her child. Part of the blame no doubt rests on the fact that the child was a late arrival, a situation usually even worse than that of the one-child family. The fault was not with the pediatricians *per se*. It was with pediatrics itself, if in that term we may include all the various forces that were directed toward making a perfect physical specimen of an individual that had a mind as well as a body. I think it will be instructive, in the present connection, to elaborate upon this point. In doing so I shall present, once more, a situation that seems to me to offer so many points of similarity to that now under discussion that one is again justified in reasoning by analogy.

It is a matter of common knowledge among pediatricians that somewhere around 50 per cent of children seen in private practice do not eat well. In a scientific investigation made among educated people in a university neighborhood the incidence of anorexia was stated to be 81 per cent. A pediatric colleague with a large office practice in a prosperous suburb estimated it at 85 per cent in his practice. A very prominent pediatrician has said that he paid for his house with anorexia. I have discussed elsewhere in detail the pathogenesis of this unique and amazing biologic phenomenon, the young of any animal refusing to eat, and will give merely an essential outline in this connection. In doing so I shall quote freely, directly or indirectly, what I have said on a former occasion:^{1, 2, 3} "The evolution of scientific artificial feeding of infants was a long, devious and complicated process. A chaos of ever increasing complexity naturally resulted, that has only recently been replaced by a chaos of simplicity. Then as now, babies were fed with about equal success by any one of

a number of methods with which the individual practitioner familiarized himself. In that earlier period it seemed necessary to observe meticulously the amount of food, the intervals between feedings, and the composition of the formula. Percentages and, later, calories were figured so much that some of us no longer like to run across either of these words, and try to keep them dark. There was something awesome, something of reverence about the word formula, from which we have not yet fully recovered. Its authority was accepted as an article of faith and its preparation and administration were a sort of household ritual. The present 'mixture' demands no such obeisance; it is only one of a lot."

Now, as is well known, a normal gain in weight is one of the essential attributes of growth in childhood and is the best, single, comparative, objective measure of normal physical development that can be expressed in figures. Always duly appreciated as such, at least in infancy, it became a sort of fetish when the campaign directed toward examining, weighing and measuring all children came as an aftermath of the World War. As a natural corollary came the height and weight charts. The scale and the measuring rod became the sole arbiters of nutrition and the height and weight tables became as fixed guides as if they had been handed down from Mount Sinai. The natural effect on the mother when confronted by a standard was to proceed to standardize her child, to make him weigh what he should for his height according to the tables. This naturally consisted in making him eat more if he weighed less than the tables called for; less, but rarely, if he weighed more. She set about characteristically to do her scientific maternal duty by her child, and struggled heroically, and futilely, as every practicing pediatrician knows, to make him eat the proper amount. Advice, admonition and exhortation poured in from all sides, lay, medical and intermediate. All avenues of escape were shut off when the school nurse entered the arena as the unflagging champion of standardization and the sworn nemesis of the tonsil. And then came vitamins, and how! No intelligent physician, least of all a pediatrician, can doubt the superlative value of all these things under ideal control. Unfortunately in all new therapeutic discoveries and movements in medicine that permit of popularization and commercialization through lay, medical or intermediate agencies, such control comes only with time and with its own innate tendency to rectification. A glance through nearly any newspaper shows that such "ideal control" has not yet arrived.

Logical as it seemed to check up on all children by weighing and measuring them periodically, and to apply in practice all this newer knowledge of nutrition to the feeding of the child, and fruitful of results as it has been in many ways, it failed signally in one respect—it failed to take biologic cognizance of fundamental psychologic factors that are innate in all human beings and most keenly so in the irresponsible, spontaneous and as yet poorly inhibited and, so, shameless period of early childhood. For the same reason that his father now carries a hip flask the child rebelled against a system that allowed him no choice as to time, place, kind, amount or manner of taking his bottle and his later foods, and which did not consider whether he was hungry or thirsty or indisposed at the time. When his mother or nurse coaxed and finally forced him to eat against his will in order to bring him up to an externally predetermined standard, as is done in the major-

ity of homes, he either refused to eat point-blank, or only under protest; or else he vomited in self-defense or from necessity, or dawdled over his meals for hours as a further protest against an arbitrarily imposed authority. The psychology of such anorexia is quite apparently a combination of a rather normal negativism; a desire for the spotlight, or for sympathy, or for domination; a conditional reflex; and I feel sure a dash of childish atavistic cruelty that finds pleasure in tormenting an enemy, in this instance his mother or nurse. That the etiology of this condition is purely psychologic becomes evident when it is found that such anorexia occurs only in the home, and is cured rapidly and almost without fail when the child is sent to an orphan asylum or to a hospital ward with other children of like age, or to a summer camp, or a boarding school, with no essential change in food, but with a fully absent mother or former nurse.

The nutritional results of such rebellion against forced feeding are still obvious on all sides, although there are encouraging signs of improvement. That is not our main concern at the present time. The child who will not eat is, *ipso facto*, a behavior problem, numerically the greatest of all, and as a factor in the genesis of further maladjustment probably second to none. One cannot fruitlessly nag or force a child to eat with such results as I have indicated without meeting and admitting failure and without losing that wholesome spontaneous discipline that alone leads to a normal behavior reaction. Now if a propaganda directed toward a matter so simple, so concrete, and so tangibly physical, can produce such a volume of abnormal behavior, or maladjustment, may one not expect an even greater reaction if to what has gone before there is added the profusion and confusion of psychologic and psychiatric and child guidance literature and activity that is being poured out in ever increasing amounts from all kinds of sources? In the one situation the mother tried to standardize her child physically, with such results as we have seen; she is now being confronted by the far more delicate and intangible problem of standardizing him behaviorly. In both situations the initial responsibility lies with the mother of deciding whether she needs or wants help in keeping her child normal, on the one hand, or getting him back to normal if he has deviated from it, on the other hand. In the nutritional problem the diagnosis was very simple. She had a baby, or an older child, she wanted to keep him well, she pursued the conventional course of consulting her physician periodically for examination and advice. If he did not seem normal it was evident, and she again called in her physician. If things did not go well it was again evident, and she took him to a pediatrician, or to another pediatrician, as the case might be. The prevention and the cure were relatively simple in nearly every instance. The diagnosis of a behavior problem is obviously not so simple. How can a mother tell when her child's behavior has risen sufficiently above the threshold of normal to constitute a problem that needs intervention? It hardly seems feasible to consult a psychiatrist periodically as she did a pediatrician, although one psychiatric group has maintained that one out of every three children should have psychiatric care. God help the race! if it is true. The pediatrician has rather lain down on the job of combining the two as he should in the natural order of things. Besides, the mother has been accustomed to thinking of the pediatrician as one who attends to physical things in childhood. She knows that there is a great child study, child

guidance, and mental hygiene movement on to help her keep, or make, her child normally adjusted in, and to, a rather complicated world. It is in the air. It sounds reasonable and logical. Science is coming to the rescue. Things have not been going as smoothly as they might, that is certain. She follows that lead and begins to read up on it; if she has time to read at all she can't escape it; it is all around her in books, in the special columns of the newspapers, sometimes several in one paper, in the bulletins from the Health Department. If she turns on the radio and is regaled by beautiful music she may soon hear a discourse on "Mental Health and How to Maintain It," followed by a chant that extols the virtues of a special brand of breakfast food. She naturally begins to scrutinize and analyze and diagnose her child's behavior more critically. She attempts scientific orientation in what before seemed only an inevitable domestic problem. She begins to see many things that she did not see before, and many things that do not exist. She is in a somewhat similar position to the sophomore medical student who finds that he has many symptoms in common with the diseases that he studies for the first time. She used to think that when her baby sucked his thumb it was either cunning or just a bad habit that needed attention, depending upon her individual reaction. She is rather startled to find out that it is really an expression of his infantile libido. But by this time she has found out that suppression of the libido is a sort of psychiatric meal ticket. What to do? She goes further and learns things even more disquieting. She has always thought that her boy was a bit trying and too much of a "mother's boy" but she never suspected that he had a complex with a name that harks back to the darkest episodes of the Greek drama. Some of her discoveries are less distressing, but no less important. She finds that he is a bit aggressive and self-centered in his interests, and the question arises of whether he has the proper chronologic balance between the egocentric and the social in his make-up. Or more often if he is somewhat timid and shy, and does not yet assert himself, he has that most banal of all complexes, an inferiority complex. No combination of two simple words has ever led to more varied interpretation and to more erudite satisfaction in popular usage.

(To be continued)

Department of Orthodontic Abstracts and Reviews

BY DR. EGON NEUSTADT, NEW YORK CITY

The Journal will welcome suggestions from its readers, sent to Dr. Egon Neustadt,
133 East Fifty-Eighth Street, New York City

Do the Permanent Molars Belong to the Second Dentition? Abstracted from "Die Entwicklung der Milchmolaren und der bleibenden Molaren des Menschen" by Dr. R. Ritter, *Ztschr. f. Stomatol.* 1933. Additional information was taken from "Normale Histologie und Entwicklungsgeschichte" by W. Meyer, 1932, Munich, J. F. Lehmann. The diagrams were made after photomicrographs in the latter textbook.

As an introduction to this article, it may be well to recall the following facts of dental embryology: When the human embryo is about one centimeter long, a thickening of the mouth epithelium occurs along the top of the upper and lower arch (Fig. 1A); the deep layers of these cells proliferate; they form an *epithelial fold* which grows down into the soft connective tissue of the jaws; this primary epithelial fold is called *the dental lamina* (Fig. 1B); it is continuous over the entire extent of the jaws but at certain intervals, which correspond to the location of the deciduous teeth, little buds grow from it (Fig. 1C). The formation of the buds which develop the deciduous and the permanent molars is the object of discussion in this article.

FORMATION OF DECIDUOUS MOLAR GERMS

When the human embryo is two centimeters long (and seven and a half weeks old), there appears on the dental lamina distal to the canine a small knot; this knot is the earliest indication of that tooth germ which later on is to form the first deciduous molar. Some time afterward, the dental lamina gives off the germ for the second deciduous molar. While the germ for the first deciduous molar is formed very closely underneath the mucous membrane of the mouth, hanging from it like a drop of water, the germ of the second deciduous molar develops deeper within the jaw, also being connected with the epithelium of the mouth, but not like a drop, more like a fruit hanging on a stem.

FORMATION OF PERMANENT MOLAR GERMS

By the time the embryo is 9 cm. long, the germ for the first deciduous molar has grown rather large, and it is still immediately below the mucous membrane; the second deciduous molar lies deeply within the jaw, being connected with the mouth epithelium by its long stem. In back of this tooth germ, the dental lamina now starts to grow further and develop a small knot which is to be the germ for the first permanent molar; the connection between this germ and epithelium of the mouth is clearly visible in the beginning, but is

lost later on; this tooth germ may again be compared to a fruit hanging down from the mouth epithelium by a stem, though the stem is longer than the one holding the second deciduous molar, and it leads not straight downward, but downward and backward (upward and backward in the maxilla). The stem itself disappears soon, leaving the germ deep in the jaw, without connection with the epithelium of the mouth.

SECONDARY EPITHELIAL FOLD

This analogy in the development of the second deciduous molar and the first permanent molar, both evolving from the distal end of the dental lamina, already suggests that the first permanent molar may belong to the first dentition.

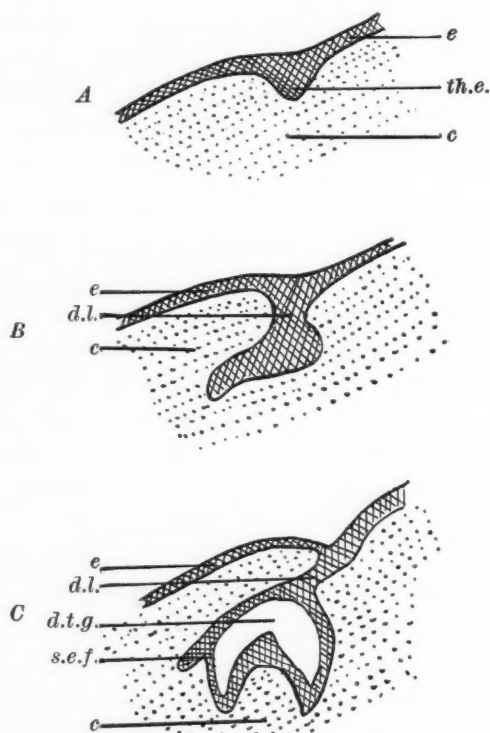


Fig. 1.—Diagram showing: A, Thickening of mouth epithelium. B, Development of dental lamina. C, Development of germ for deciduous tooth; e, mouth epithelium; th.e., thickened mouth epithelium; c, connective tissue of jaws; d.l., dental lamina; d.t.g., deciduous tooth germ; s.e.f., secondary epithelial fold.

This belief is strengthened by a study of the development of the germs for the second teeth. We know that the deciduous molar germs—as well as the germs of all deciduous teeth—show the formation of a secondary epithelial fold at the junction of the dental lamina and tooth germ; this secondary fold appears above the mesial part of the deciduous tooth germ; it has a tongue-like appearance, and it grows in a lingual and apical direction; by the time the deciduous tooth germ has developed into the deciduous tooth and is erupting, this secondary epithelial fold is forming the tooth germ for the permanent tooth and now lies below and slightly to the lingual of the deciduous tooth. (It must be emphasized that the secondary epithelial fold is a structure entirely different from the dental lamina. The dental lamina is a downward growth of the mouth

epithelium; it runs continuously through the whole length of the jaws, giving off at intervals the deciduous tooth germs. The secondary epithelial fold, however, is a separate structure formed only at the site of each individual deciduous tooth germ. Some investigators believe it to develop from the end of the dental lamina, while others consider it to grow out of the epithelium of the deciduous tooth germ itself. However this may be, the secondary epithelial fold appears to develop *directly under the influence of the deciduous tooth germ*. —E. N.)

The interesting point now is that the first permanent molar does not develop from such a secondary epithelial fold as do the rest of the permanent teeth. As pointed out before, it develops directly from the dental lamina. And after the tooth germ for the first permanent molar has developed, there is even formed a secondary epithelial fold; it is first seen in a seven-month-old embryo, lies above the mesial part of the permanent molar germ, and grows in a lingual direction. (Fig. 2.)

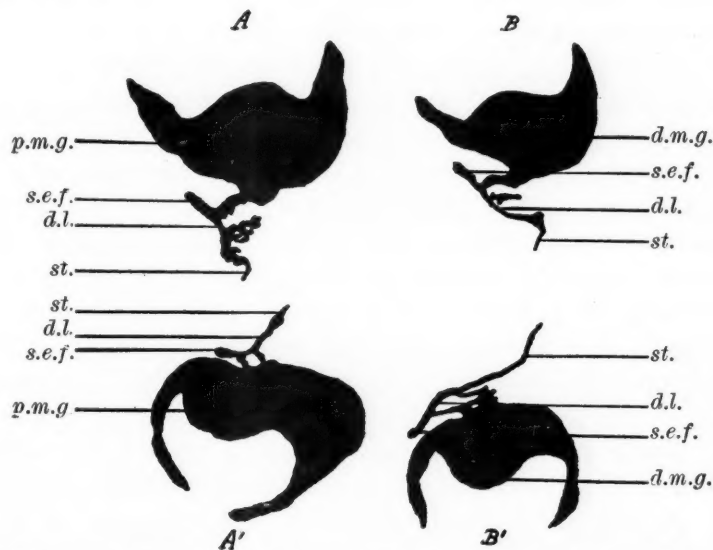


Fig. 2.—Diagram showing the similarity in the development of secondary epithelial folds on permanent molar germs as compared with deciduous molar germs. A and A', germs of maxillary and mandibular permanent molars; B and B', germs of maxillary and mandibular second deciduous molars; p.m.g., permanent molar germ; d.l., dental lamina; st., stem connecting dental lamina with mouth epithelium; s.e.f., secondary epithelial fold which in the deciduous molars (B, B') develops into the premolars, while in the permanent molars (A, A') it deteriorates without developing into a tooth.

CONCLUSION

It has been assumed by previous investigators, that this secondary fold gives off the tooth germ for the second permanent molar. This theory would make the first permanent molar a tooth of the first dentition, and the second molar one of the second dentition (without the status of the third molar being decided). However, this theory is incorrect: the secondary epithelial fold of the first permanent molar germ does not form the second molar germ; it forms no germ at all, but grows only little, reaches its maximum size at the age of eight months after birth, remains for a while stationary at that size, and finally deteriorates and disappears. The secondary epithelial fold was examined in a newborn child and found to be at the same stage of development as in the eight-

month embryo; in one case it appeared as if the duplicate fold were trying to form another tooth germ. While the germ of the first permanent molar grows and differentiates, the secondary fold slowly disappears. In a five-month-old child its size had not increased, though no signs of its deterioration could as yet be found, while in a child two and a half years of age the regressive changes in the secondary fold were clearly visible.

The dental lamina has meanwhile grown further distally and further downward in the jaw, finally giving off the tooth germ for the second permanent molar. And again there develops the secondary epithelial fold which we have conceived as the rudimentary bud for a second tooth; it lies above the mesial part of the second molar germ and grows in a lingual direction, while the dental lamina itself grows further distally in order to form the third molar.

The third molar germ again develops in a similar manner as the first and second molars from the same dental lamina which has previously given off the germ for all the deciduous teeth and for the two permanent molars; also here a secondary fold is formed which eventually deteriorates and disappears.

This article opens up a new phase of the old controversial question whether the three permanent molars belong to the first or to the second dentition. The fact that they are the first teeth to erupt in the molar region has been an indication to consider them as belonging to the first set, while their permanency and their lack of successors spoke decidedly for their connection with the second set. A substantiation of Meyer's findings will remove one of the latter arguments, because the development of the secondary epithelial fold may be considered analogous to the development of the tooth germ for a second tooth. The proofs that Meyer presents are entirely scientific. In beautiful photomicrographs he shows distinctly the primary epithelial fold, called the "dental lamina," which runs continuously from one tooth germ to the other, and which gives off the germs for all the teeth of the first dentition; from this dental lamina he differentiates clearly the secondary epithelial fold, which only develops at the site of a deciduous tooth germ and which itself forms all the teeth of the second dentition; the germs for the permanent molars, now, are given off by the dental lamina; and they again develop regular secondary epithelial folds; while these folds are only rudimentary and form no second teeth, the analogy with the secondary epithelial fold of the other deciduous teeth which later develop into the teeth of the second dentition, is convincing.

THE FORUM

IN MY practice in the last twenty years I have had this same thing happen twice. Recently I had a case of distoclusion that would not respond to treatment. The patient was about thirteen years of age, a well-mannered boy and very obedient. He wore the maxillary elastics regularly, but after about two years' treatment without results I took the appliances off and let him go away for a summer's vacation. On his return I was replacing the molar bands when his mother came into the operating room to excuse herself for bringing the boy late; she said that he had been detained at school for orchestra practice. I asked what kind of an instrument he played and was told a clarinet. I immediately knew from having played in a brass band sixteen years myself why I had accomplished nothing in the treatment of this case of distoclusion.

To play the clarinet you must cover the mandibular anterior teeth with the lower lip and the maxillary anterior teeth with the upper lip. This causes the pressure by the clarinet mouthpiece just the opposite from what the maxillary elastics try to do in drawing the maxillary teeth back and the mandibular teeth forward.

There is absolutely no use in trying to regulate a case of distoclusion if the patient is playing a clarinet. Had this been a case of mesioclusion it would have worked just the opposite, and playing a clarinet I think would be a great help as the pressure would be out on maxillary anterior teeth and back on the mandibular teeth.

I think it would be well to ask our patients whether they play any wind instruments before we start treatment on a case.

(Signed) WILL J. KEYS,
Hutchinson, Kansas.

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EDITORIAL

The Revival of Dentistry

A JACK RABBIT lying close to the ground under a sagebush on the great plains of Texas knows nothing about the intricate mechanism of the trimotor airplane flying 200 miles an hour 2,000 feet over his head; however, it is safe to assume the rabbit knows as much about the mechanical intricacies of the airplane as some of the current writers in dental journals know about diagnosis, treatment, and correction of malocclusion of the teeth, about which they presume to write. To quote, for instance, from one of them: "Orthodontia, if for no

other reason save monetary considerations, is one method of correcting a financially distressed dental practice. Competition is not so keen as in the ordinary dental practice, and the alluring ads of the advertising offices will never attract the children for orthodontia correction."

Another quotation which exposes adequately the writer's general lack of information upon the subject under discussion advises the dental profession ostensibly "What to Do" about the treatment of cases of malocclusion, although the identical opinion among orthodontic authorities could be advisedly quoted under the caption of "What Not to Do." To quote again: "Take impressions of both the upper and the lower jaws and send them to a qualified laboratory for their advice and for the construction of the appliances. Some of those institutions of prosthetic constructive work have graduate, specially trained orthodontists who can advise you very well in your attempt to serve in this much needed aspect of dentistry."

In no other department of dentistry could such misinformation be spread through the printed pages of current dental journals without a storm of protest. Orthodontists instead of writing the *INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN* protesting about other journals' printing information contrary to generally accepted orthodontic concepts, should write to the editors of the journals who publish this material and ask them to be more careful about an author's text when publishing original material and opinions in regard to the practice of orthodontia. These articles usually have not been read before any society but are opinions of individuals about a subject of which they obviously know very little, and the articles are important only because they are published in journals with very wide circulation among the members of the dental profession.

The authors of these extraordinary papers, of unorthodox orthodontic treatment, would probably say: "The question is violently controversial—in the eyes of the adherents of the orthodox treatment methods either you belong to the church or you are a heretic. Running for middle ground in treatment, you are assailed for incompetency or ignorance." The answer should be that if a dentist sends his plaster casts of malocclusion away for diagnosis, construction and the designing of appliances for treatment, he is, therefore, admittedly incompetent to treat the case because he is unable to diagnose it, and the man to whom the casts are sent for diagnosis is unable to diagnose the case because malocclusion cannot be properly diagnosed from plaster casts alone.

There is one good suggestion in the article referred to above: that the dentist who desires to treat malocclusion should avail himself of every opportunity to improve his knowledge of the subject by reading modern works and doing postgraduate work of various types. If the dentist should act upon this latter suggestion, he would soon realize the total inadequacy of laboratory diagnosis of malocclusion.

If the extraordinary fundamental principles of treatment of malocclusion as advocated in "The Revival of Dentistry" are practical, sensible or impor-

tant, then from eight hundred to one thousand orthodontists who devote their entire time to the correction of malocclusions are wrong. If these methods are right and if the dental profession in being urged to use them is right, then Angle, Case, Dewey, and many of the departed pioneers were wrong. Orthodontists should and must protest directly when articles which they know reflect the wrong concept of the subject are given wide publicity.

—H. C. P.

BOOK REVIEW

Index of the Periodical Dental Literature*

Index of the Periodical Dental Literature, including 87 publications in England, Canada, Australia, New Zealand and the United States, 1927-29. Compiled by Arthur D. Black, A.M., M.D., D.D.S., Sc.D.

This volume covers a three-year period of dental literature, 1927-29, and is the eleventh of a series to be published. The first volume covered the literature for 1911-1915; the second, 1916-1920; the third, 1839-1875; the fourth, 1876-1885; the fifth, 1886-1890; the sixth, 1891-1895; the seventh, 1921-1923; the eighth, 1924-1926; the ninth, 1896-1900; and the tenth, 1901-1905.

This publication has been issued previously and the labors of the executive are rendered voluntarily. This volume completes the Index from 1839 to the end of 1929 with the exception of a very short period, 1906-1910, and it is expected that the later period will be covered by the next volume published.

The volume contains a bibliography of dental society proceedings, transactions, papers and publications, compiled by Dr. Edward C. Mills, with the assistance of Miss Louisa Reazin and Doctors B. W. Weinberger, A. F. Isham, J. D. Dow, L. P. Anthony and E. E. Haverstick. It covers thirty-six pages and is of much historical interest.

The profession is greatly indebted to the authors of this volume which is of great convenience and of infinite value.

*Published by the Dental Index Bureau, 381 Linwood Ave., Buffalo, N. Y.: and Henry Kimpton, London, England.

NEWS AND NOTES

Southern Society of Orthodontists

The thirteenth annual meeting of the Southern Society of Orthodontists will be held at The Homestead, Hot Springs, Virginia, July 16, 17 and 18.

A cordial invitation is extended to all ethical members of the dental and medical professions.

N. F. MUIR, President,
Shenandoah Life Bldg.,
Roanoke, Va.
WILLIAM P. WOOD, JR., Secretary,
442 W. Lafayette Street,
Tampa, Fla.

Kansas, Missouri and Oklahoma Tri-State Meeting

The state dental associations of Kansas, Missouri and Oklahoma will hold their annual meetings jointly at the Ararat Temple, Kansas City, Mo., May 6, 7, 8 and 9. An excellent program has been arranged, and all members of the American Dental Association are cordially invited to attend.

FRED A. RICHMOND,
305 Federal Reserve Bldg.,
Kansas City, Mo.

Thomas P. Hinman Midwinter Clinic

The annual meeting of the Thomas P. Hinman Midwinter Clinic will be held Monday and Tuesday, March 12 and 13, 1934, at the Biltmore Hotel, Atlanta, Ga.

JOS. D. OSBORNE, Secretary,
604 Doctors' Building,
Atlanta, Ga.

